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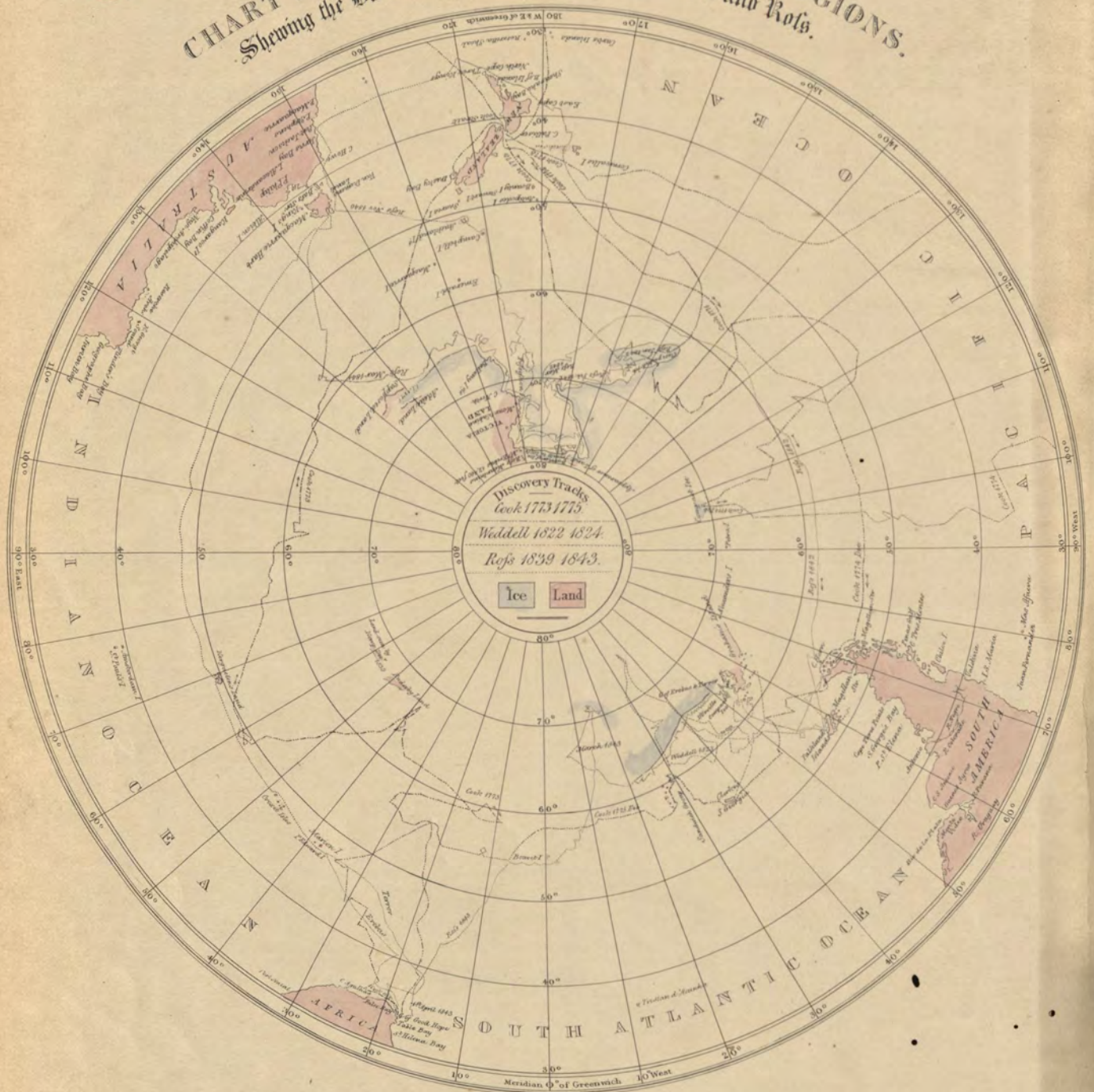
CHART OF THE SOUTH CIRCUMPOLAR REGIONS.

Shewing the Discovery Tracks of Cook, Weddell and Ross.



Printed and Published by Reeve Brothers.
1844.

THE BOTANY

OF

THE ANTARCTIC VOYAGE

OF

H.M. DISCOVERY SHIPS *EREBUS* AND *TERROR*,

IN THE YEARS 1839—1843.

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UNDER THE COMMAND OF

CAPTAIN SIR JAMES CLARK ROSS, Kt., R.N., F.R.S., &c.

BY

JOSEPH DALTON HOOKER, M.D., R.N., F.L.S.,

ASSISTANT SURGEON OF THE "EREBUS" AND BOTANIST TO THE EXPEDITION.

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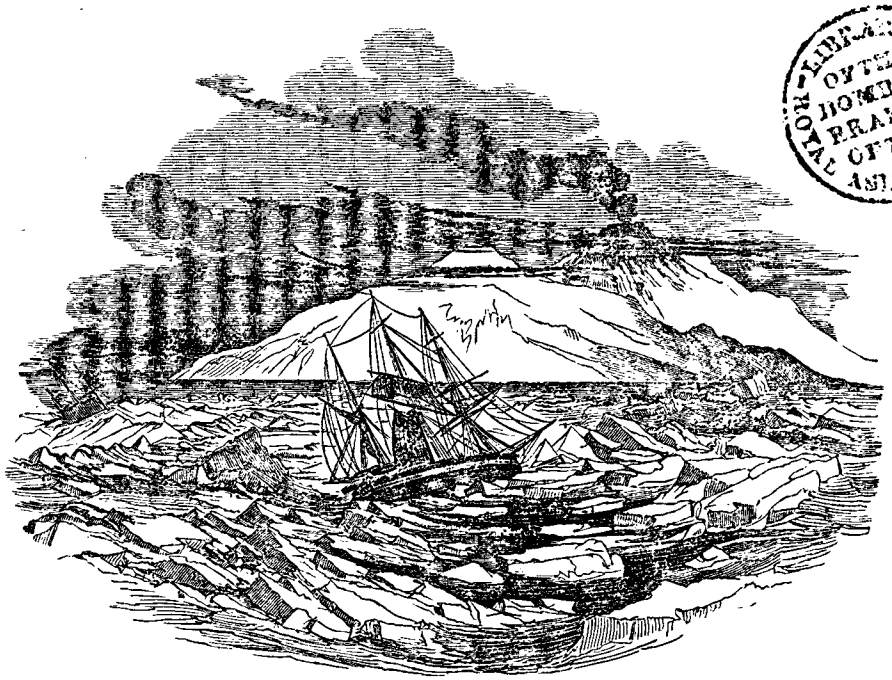

Victoria Barrier and Land. Lat. 78 deg. S. *Mount Erebus* (active Volcano), *and Mount Terror.*

Published under the Authority of the Lords Commissioners of the Admiralty.

LONDON:

REEVE, BROTHERS, KING WILLIAM STREET, STRAND.

1847.

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TO

Her Most Gracious Majesty,

QUEEN VICTORIA,

UNDER WHOSE BENIGN AUSPICES

THE ANTARCTIC CIRCUMPOLAR VOYAGE,

LATELY MADE BY

HER MAJESTY'S SHIPS 'EREBUS' AND 'TERROR,'

UNDER THE COMMAND OF

CAPTAIN SIR JAMES CLARK ROSS, R.N.,

WAS AT ONCE SKILFULLY PLANNED AND SUCCESSFULLY ACCOMPLISHED;

THE PRESENT WORK,

ILLUSTRATIVE OF THE BOTANY OF THE VOYAGE,

IS, WITH PERMISSION,

MOST HUMBLY DEDICATED

BY

HER MAJESTY'S DEVOTED AND DUTIFUL SERVANT,

THE AUTHOR.

Royal Botanic Gardens,
Kew, May 1, 1845.

I.

FLORA ANTARCTICA.

PART I.,

BOTANY OF LORD AUCKLAND'S GROUP AND CAMPBELL'S ISLAND.

SUMMARY OF THE VOYAGE.

IN the beginning of the year 1839, the British Government having determined on fitting out an Expedition, for the purpose of investigating the phænomena of Terrestrial Magnetism in various remote countries, and for prosecuting Maritime Geographical Discovery in the high southern latitudes, H.M. Ships Erebus and Terror, commissioned by Captain Sir James Clark Ross, sailed from Chatham on the 29th of September 1839. In addition to carrying out the above-mentioned leading views, it was enjoined to the officers, that they should use every exertion to collect the various objects of Natural History which the many heretofore unexplored countries about to be visited would afford.

On the outward voyage we touched at most of the Atlantic Islands, making a longer stay at some of them than is usual, on account of the nature of the observations that were instituted. At Madeira, which was the first visited, we called in the middle of October, and remained eleven days; and then made Teneriffe and the Cape de Verds, whence we sailed for and landed upon St. Paul's Rocks*, under the Line, in long. 29° W. St. Helena was the next destination, and the course which it was found necessary to follow took us to the Island of Trinidad off the Brazilian coast, lat. 20° S.

After spending a week at St. Helena, the vessels sailed for the Cape of Good Hope, arriving there on the 4th of April 1840. The Cape may be regarded as the starting-

* For an admirable description of these remarkable rocks, distant 350 miles from the nearest land (the Island of Fernando Noronha), see Mr. Darwin's Journal, p. 8.

point, whence the real object of the voyage, namely that which included South Polar Discovery, would commence. On the 6th of April 1840 we quitted Simon's Bay, and first entered a cold and inhospitable latitude (42° S.) on the 17th of the same month; then, only four days after, holding a westward course, we passed to the south of Marion's Island, formed of flat terraces of black volcanic rock and cone-shaped mountains, often of a reddish tinge, and towering to a considerable height. Here occurred the first botanical phænomenon, the *Macrocystis pyrifera* (a remarkable gigantic seaweed), being exceedingly abundant. The ships were hove to between Marion's and Prince Edward's Islands, with the view to going ashore the following day; but during the night a heavy gale arose which drove them far to the westward, thus disappointing the hopes which had been formed of collecting objects of natural history on an island never previously explored by any scientific individual.

On the 28th, after a succession of storms, the Crozet Islands were gained: this group lies far to the westward of the position that had been assigned to it, namely in lat. 47½° S. and long. 46–48° E.; and here the same disappointment awaited us, for after being blown off, and again on the 1st of May beating up to Possession, the most eastern of the cluster, the threatening appearance of the weather forbade any attempt to land. The Crozet Islands are all volcanic, and of the wildest and most rocky aspect; the harbours are very few, and some of the islands are entirely inaccessible. The mountains rise in peaks and cones to an elevation of 4000–5000 feet, exhibiting patches of perpetual snow on the summits, while dense fogs frequently envelope their bases, borne from the sea, to such an elevation, that the highest points alone are visible. To all appearance the vegetation is equally scanty and stunted as that which Kerguelen's Island afterwards afforded, and the questions which were put to a party of miserable sealers who came off to the ship, elicited no satisfactory information as to whether the valuable "*Cabbage*" of the latter island also inhabits the Crozet group. Scudding before heavy westerly gales, on the 6th of May a remarkable conical rock, called Bligh's Cap, was descried; it lies off the north-west extremity of Kerguelen's Island; but thick weather prevented Sir James Ross from making the land, from which the ships were again driven to a distance of 150 miles and obliged to beat back, finally casting anchor in Christmas Harbour, on the 12th of May 1840.

At Kerguelen's Island, all the plants that had been originally detected by the illus-

trious Cook were gathered during the two and a half winter months that the "Erebus and Terror" staid there, together with many other species, a remarkable proof of the uniformity of the climate, and the comparative mildness of the winter season. The ships left Kerguelen's Island on the 20th of July, and arrived in the river Derwent, Van Diemen's Island, on the 16th of August 1840.

On the 12th of November 1840, we quitted Hobarton for our first voyage to the South Pole, during which the only places visited which yielded many plants were Lord Auckland's Islands, lat. 50½° S., long. 166° E., where we arrived after a week's sail from the last-mentioned coast, and staid there during the spring months of that latitude, and Campbell's Island, in lat. 52½° S., long. 169° E. Quitting that island again on the 17th of December, the ships finally sailed for an entirely unexplored region of discovery. The *Macrocystis* and *D'Urvillæa* were found in large vegetating floating patches, nearly as far south as any open water remained free of bergs, in lat. 61° S. The vessels entered the pack-ice in lat. 68° S., long. 175°.

During this voyage the vast extent of continent, since called "Victoria Land," was discovered*, together with the active volcano "Mount Erebus," the extinct one "Mount Terror," and that icy barrier, which, running east and west, in the parallel of 78° S., prevents all farther progress towards the pole†. Two small islets were landed upon: one in lat. 71° 49′ S., long. 170° 52′ E.; the other, Franklin Island, in lat. 76° S. and long. 168° 59′ E.; but neither of these spots presented the slightest trace of vegetation. On the return voyage the *Macrocystis* again occurred, floating as usual in immense masses, in lat. 51° 10′ S., and long. 137° E.

The expedition returned to Hobarton, Van Diemen's Island, late in the autumn (of that latitude), April 7th, 1841; on the 7th of July again started from Van Diemen's Island, and after a short visit to Sydney, cast anchor in the Bay of Islands, New Zealand, August 18th, 1841, where we remained three months. This time was spent in collecting materials for a Flora of New Zealand, in which object we received great assistance from Mr. Colenso and many other gentlemen, by means of whose zealous cooperation our collections were rendered extremely valuable.

The second exploring voyage was commenced on the 15th of November 1841. It had been Captain Ross's intention to land on Chatham Island, in lat. 44° S. and 176°

* *Vide* Chart. † *Vide* Vignette.

W., but the prevalence for several days of the densest fogs frustrated all attempts to sight the land. This was much regretted, for few* of the plants of that interesting group are known to botanists. After tracing the *Macrocystis* into the 57th parallel, the ships entered an ice-pack of immense magnitude on the 18th of December, in lat. 62° S. Here we were entangled till Feb. 2nd, 1842 (the midsummer of those cheerless regions), making no more progress during that time than from the latitude just mentioned to 68°, where we emerged into comparatively open water to the southward of a large body of the pack, which however trended to the westward. At this time the season was far advanced, and as, in the preceding year, the retreat had been commenced, through absolute necessity, on the 9th of February, so Captain Ross did not think proper now to re-enter the pack-ice, but proceeded along its edge to the westward, advancing so far as 187° W., and then to the southward and eastward. On the 20th of February a gale came on, which, though in open water, was sufficiently trying; the wind was very high, and the spray which beat over the ships became frozen ere it reached the deck, forming every object into a mass of ice; the coils of rope were covered by an icy incrustation several inches thick, and most of the running-gear about the bowsprits was carried away by the weight of ice formed on it.

On the 23rd of February the expedition came in view of the grand Victoria Barrier: the day being fine, the voyagers approached within a mile and a half of the Barrier, finally reaching 78° 10′ S. lat. in the long. 162° W., having made six miles farther than in the preceding year, the highest latitude hitherto attained. Under all circumstances, this was more than had been expected; for after the long detention, the rapidly closing season rendered any progress very difficult; but it was a great object to verify the magnetic and other observations, and to ascertain still more positively the position of the pole. Unable to proceed eastward, the retreat was commenced, tracing the pack edge. Seaweed was again met with on reaching the parallel of 64°, and occasionally seen when running down the parallel of 60°, from 170° W. to 80° W., and thence in great abundance to the Falkland Islands, where the ships anchored in Berkeley Sound on the 6th of April 1842, not having seen land for 138 days, since leaving New Zealand.

A prolonged stay in the Falklands, though the season was winter (April to the beginning of September), afforded ample opportunities for thoroughly investigating the

* These few were collected by Dr. Dieffenbach, and are now deposited in the collection of Sir W. J. Hooker.

Flora of that interesting and now highly important group, which, though it had been partially examined by Admiral D'Urville, and previously by the officers of that unfortunate ship, the "Uranie," under the command of Captain Freycinet, still afforded considerable novelty.

On the 6th of September, the early spring of the southern latitudes, the "Erebus and Terror," with a portion of the officers, sailed from Berkeley Sound for the neighbourhood of Cape Horn, and arrived there, after having been driven far out of their course by the equinoctial gales, on the 21st, casting anchor in St. Martin's Cove, Hermit Island, lat. 56°, within a few miles of the far-famed Cape Horn, which is immediately opposite the mouth of the Cove. This is the most southerly spot on the globe which possesses anything above a herbaceous vegetation. Here, in the sheltered bays, the two kinds of *Antarctic Beech*, the *Evergreen* and *Deciduous*, form a dense, though small forest, and ascend, in a stunted form, to an elevation of 1000 feet on the hills. Many of the plants gathered during Cook's first voyage, by Sir Joseph Banks and Solander, and by Forster during his second, as also those which Mr. Menzies had detected, when accompanying Vâncouver's expedition, and which have not been hitherto published, were found again; and when the ships returned to the Falklands in November, Captain Ross transported many hundreds of young *Beech-trees* and caused them to be planted there, in hopes that the productions of so near a country might be found to succeed on these treeless islands. Some were also sent home and have since been distributed in England, from the Royal Botanic Gardens of Kew.

The third cruise to the South Polar Regions was commenced on the morning of the 17th of December 1842, when the expedition sailed from Berkeley Sound. An opportunity was afforded again of tracing the southern limit of Seaweeds. The *Macrocystis* was lost in lat. 55° S.; long. 57° W.; but on attaining lat. 63°, long. 54°, another species appeared which had been originally discovered by Webster during the stay of Captain Forster's ship, the "Chanticleer," in Deception Island, one of the South Shetland group, and again found by the expedition of Admiral D'Urville, and has since been published under the name of *Scytothalia Jacquinotii*. On the 28th land was made, a portion of Palmer's Land, to which the name of "Terre Louis Philippe" has since been given by D'Urville. The ships were already in the pack-ice, through which we penetrated, tracing the land to 64°, and seeing a small volcanic island, lying a few miles off

the coast (Cockburn's Island), we landed upon it. The vegetable productions only amounted to twenty Cryptogamic species, three of them *Seaweeds*. Unable, after a series of fruitless efforts, to penetrate farther than 65°, and after having been more or less entangled in the ice for thirty-seven days, Sir James Ross finally bore up, and when, with great difficulty, the ships had been extricated from the pack-ice, we commenced tracing its edge to the eastward. A succession of easterly gales rendered the progress in the advancing season tedious, most uncomfortable, and hazardous. At last however, on the 22nd of February 1843, the pack was lost sight of, trending to the south-west. On the 28th the Antarctic Circle was recrossed, and in spite of the rapidly shortening days, dark nights, and continual bad weather (for throughout the month of February, corresponding to an English August, only one day elapsed without snow), the Commander persevered in holding a southerly course. On Sunday the 5th of March, the weather being very thick, with snow-squalls, white petrels were seen, a bird whose appearance affords a sure indication of the proximity of pack-ice, and on the afternoon of the same day a heavy pack was descried, only a few yards ahead, with a terrific surf beating on it. The ice here was such as not to allow of being "taken" (or entered), even under the most favourable circumstances, and the ships were accordingly put about in lat. 71° 30′ S., long. 15° W.

The thickness of the weather made it impossible to ascertain the course and position of the pack, and the Northward Voyage was commenced under violent N.E. equinoctial gales. Beating to the northward, the ice occurred on both tacks, and the vessels were found to be in a bight of the pack, with the ocean loaded with bergs, and while the continued snow-squalls prevented the possibility of seeing any object ahead, the heavy seas and snow-laden state of the rigging rendered all human exertions ineffectual. From that date till the 11th of March, matters remained much the same, the ships beating to the northward with as much press of sail as could be exposed, trusting to Providence alone for guidance among the bergs. On the 19th the position assigned to Bouvet's or Circumcision Island was gained, but the weather rendered all endeavours, for three days, to discover land in this place of no avail. Both ships had a narrow escape of running foul of an iceberg, over which the sea was breaking, eighty feet high. The "Erebus," passing to windward, struck one of the floating masses from it; and the "Terror," to windward of her consort, did not discover the danger till almost too late,

when bearing up, she ran along the edge of the berg in the wash of the surf. On the 24th *D'Urvillæa* and *Macrocystis* were seen in lat. 51° S., and the last berg on March 25th, in lat. 47° S., the ships finally gaining the Cape of Good Hope on the 4th of April 1843, within two days of three years after they had first quitted that port for the high southern latitudes.

Respecting the climate of the various regions visited by the expedition, and especially that which prevails within the Antarctic Circle, little need here be said; except that the vast proportion which water bears to land, tends to render the temperature uniform throughout the year, and the farther south is the position, the more equable does the climate seem to be. No analogy can prove more incorrect than that which compares the similar degrees of latitude in the north with those of the south. The most casual inspection of the map suffices to show the immense proportion of sea to land in the southern hemisphere, the mass of the continents terminating to the north of lat. 40° S., America alone dwindling away to the fifty-sixth degree. The scattered islands discovered to the south of this are therefore removed from the influence of any tracts which enjoy a better or continental climate. The power of the sun is seldom felt, and unless in the immediate neighbourhood of land, and accompanied by a comparatively dry land-wind, that luminary only draws up such mists and fogs as intercept its rays. After entering the pack-ice between 55° and 65°, the thermometer seldom, during any part of the summer day, rises above 32° or falls below 20°; and while the southerly winds bring snow, the northerly ones transport an atmosphere laden with moisture, which, becoming at once condensed, covers the face of the ocean with white fogs of the densest description.

All islands and lands to the southward of 45° partake more or less of this inhospitable climate, which, though eminently unfavourable to a varied growth of plants, still, from its equable nature, causes a degree of luxuriance to pervade all the vegetable kingdom, such as is never seen in climates where the vegetable functions are suspended for a large portion of the year. The remoteness of these islands from any continent, together with their inaccessibility, preclude the idea of their being tenanted, even in a single instance, by plants that have migrated from other countries, and still more distinctly do they forbid the possibility of man having been an active agent in the dissemination of them. On the contrary, the remarkable fact that some of the most

peculiar productions are confined to the narrowest limits, is a strong argument in favour of a general distribution of vegetable life over separate spots on the globe. Hence it will appear, that islands so situated furnish the best materials for a rigid comparison of the effects of geographical position and the various meteorological phænomena on vegetation, and for acquiring a knowledge of the great laws according to which plants are distributed over the face of the globe. These subjects are however foreign to the present sketch, the author of which hopes, ere long, to have an opportunity of dwelling upon them at large and in a different form.

Those persons who have spent a series of years on the ocean, in pursuit of a favourite science, know how little can be effected by the unaided efforts of one individual, and where much is accomplished, how large is the debt of obligation incurred, not only to the facilities afforded by shipmates, but to the accommodating disposition of those with whom he comes in daily contact, and with whom he literally shares one cabin and one table. The author may here be allowed to say, that no man can be more deeply sensible than he is of the rare privilege he enjoyed, in having messmates who were ever ready to sacrifice their own convenience for his accommodation. Most especially does he feel it incumbent on him here to return his thanks to the commanding Officer of the expedition (as is his first duty) for the opportunity afforded of accompanying him, for the kindness always shown during this the most important and interesting scientific voyage that has been accomplished since the days of Cook, and for the generous manner in which that officer's private cabin and library were unreservedly placed at his disposal during the whole time the expedition was afloat. Attached as Sir James Clark Ross has ever been to the various branches of Natural History, he took a pleasure in promoting the interests of the collections at all times, and himself gathered many of the plants here described.

There were few of the officers of either ship who did not contribute something to the collection of plants; but the botanist feels it peculiarly imperative on him here to enumerate and return his especial thanks to Mr. Lyall, Lieut. Smith, and Mr. Davis. Mr. Lyall indeed, as appointed to take charge of the botanical collections on board the "Terror," formed a most important herbarium, from which great assistance has been derived, amounting to no less than 1500 species.

BOTANY

OF

THE ANTARCTIC VOYAGE.

FLORA ANTARCTICA.

I. LORD AUCKLAND'S GROUP AND CAMPBELL'S ISLAND.

UNDER this head will be considered the Botany of the few small islands which lie to the south of New Zealand, at least so far as have hitherto been examined. Of these, the two most important, Lord Auckland's group, in 50½° S. lat., 166° E. long., and Campbell's Island, lat. 52½° S. and long. 169° E., were visited by the "Erebus and Terror," and the former also by the French and American Discovery Ships*.

Upon McQuarrie's Island, lat. 55° S., long. 159° E., a very few plants have been collected, which are deposited in the herbarium of Mr. Brown, and some in that of Sir William Hooker, at Kew. I am not aware that any account has been published of these islands, nor of Emerald Island (lat. 57° S., long. 163° E.), the botany of which is entirely unknown, but which probably in this meridian constitutes the southern extreme of terrestrial vegetation. Floating masses of *Macrocystis* and *D'Urvillæa* are found, however, living and growing on the limits of the pack-ice, as far as the parallel of 64° S.

The Flora of these islands is closely related to that of New Zealand, and does not partake in any of those features which characterize Australian vegetation. Most of the plants may indeed be presumed to exist on the unexplored mountains, especially those of the middle and southern islands, of New Zealand; but others are doubtless peculiar to those higher southern latitudes which they inhabit, thus being analogous to

* A few of the plants collected by the French have been published by two of the officers of Admiral D'Urville's Expedition, under the title of 'Voyage au Pôle Sud, Botanique.'

those few novel forms that appear only in the most arctic parts of America. Even between the floras of Lord Auckland's and Campbell's Islands a marked difference exists, several species growing most abundantly in the latter which are not found at all in the former, where also the proportion of species common to other Antarctic countries is less, and the affinity is greater with the productions of New Zealand.

Lord Auckland's Group.—A view of this small and very limited group, of about twenty miles long and eleven in its greatest breadth, as it appears on approaching from the sea, presents an almost equal distribution of wood, shrubs, and pasture-land. The mountains are low and undulating, nowhere exceeding 1400 or 1500 feet, clothed for their greater part, but scarcely to the very summits, with long grass, and frequently covered during November and December, though not generally, with snow. The climate is rainy and very stormy, so that on the windward sides the plants are stunted and checked, and resemble those of a higher southern latitude, or of an elevation several hundred feet above that which the same species inhabit on the sheltered parts. The whole group of islands appears formed of volcanic rocks, mostly of black trap, whose decomposition, especially among the ranker vegetation of the lower grounds, produces a deep rich soil. A *Myrtaceous tree* (*Metrosideros umbellata*) forms the larger proportion of the wood near the sea, and intermixed with it grow an arborescent species of *Dracophyllum*, several *Coprosmas*, *Veronicas* (frutescent), and a *Panax*. Under these, and particularly close to the sea-beach, many *Ferns* abound; conspicuous among them is a species with caulescent or subarborescent stems half a foot and upwards in diameter, crowned with handsome spreading tufts of fronds. Beyond the wooded region, some of the same plants, in a dwarf state, mingled with others, compose a shrubby broad belt, which ascends the hill to an elevation of 800 or 900 feet, gradually opening out into grassy slopes, and succeeded by the alpine vegetation. It is especially towards the summits of these hills that the most striking plants are found, vying in brightness of colour with the Arctic Flora, and unrivalled in beauty by those of any other Antarctic country. Such are the species of *Gentian*, and a *Veronica* with flowers of the intensest blue, several magnificent *Compositæ*, a *Ranunculus*, a *Phyllachne*, and a *Liliaceous* plant whose dense spikes of golden flowers are often so abundant as to attract the eye from a considerable distance. Here too the vegetable types of other Antarctic lands may be seen in the greatest number, and even such as are analogous to the Arctic productions, none of which can be more decided than a species of *Hierochloe*, *Potentilla*, *Cardamine*, *Juncus*, *Drosera*, *Plantago*, *Epilobium*, several *Grasses*, and *Mosses* belonging to the genera *Andræa*, *Conostomum* and *Bartramia*. Many of the plants in the lower grounds are no less striking and beautiful, as an arborescent *Veronica* bearing a profusion of white blossoms, a maritime *Gentian*, a handsome large-flowered *Myosotis*, the magnificent *Aralia polaris* (Hombr. and Jacq.), two fine kinds of *Anisotome*, and several beautiful *Ferns*.

Ranunculus pinguis Hook. fil.

Fitch del.

prel. lith. Linn. Soc.

Campbell's Island, two degrees to the southward of Lord Auckland's group, is smaller, far more steep and rocky, with narrow sheltered valleys, and the broader faces of the hills much exposed, and hence bare of any but a grassy vegetation. Except in the bays, the coast is as iron-bound as that of St. Helena, the rocks assuming even a wilder and more fantastic form. Ever lashed by heavy swells, and exposed to a succession of westerly gales, this land affords no holding-place for such trees as skirt the beaches of Lord Auckland's Islands. In the narrow, sinuous bays, however, the scene is quite changed, for they are often margined by a slender belt of brushwood, with an abundant undergrowth of *Ferns*, stretching up the steep and confined gulleys.

The geological features of the two islands are alike, and the only difference in climate consists in that of Campbell's Island being still more forbidding and dreary. Fogs, snow-squalls and mists are the prevailing meteorological phænomena of these regions, and though such a state of atmosphere has a tendency to check the general mass of vegetation, still the constant moisture and equable temperature thus afforded support a luxuriant herbage in the very sheltered valleys. In Campbell's Island, the mountains, which rise very abruptly to about 1300 feet, are almost bare of vegetation, their rocky sides presenting a larger proportion of *Grasses*, *Mosses* and *Lichens* than in Lord Auckland's group. Though all the handsomer plants are also found in the larger of the latter islands, yet, by growing here at a much lower elevation and in far greater abundance, they form a more striking feature in the landscape, the golden-flowered *Liliaceous* plant being conspicuous, from its profusion, at the distance of a mile from the shore.

I. RANUNCULACEÆ, *Juss.*

1. RANUNCULUS (Hecatonia) *pinguis*, Hook. fil.; acaulis, carnosus, pilosus, foliis omnibus radicalibus longe petiolatis reniformi-rotundatis crenato-lobatis, petiolis basi late vaginantibus, scapis crassis nudis v. 1–2-bracteatis folia æquantibus unifloris, sepalis 5–8 calyce brevioribus obovato-cuneatis v. linearibus, nectariis 3 quandoque nullis v. obsoletis, carpellis numerosissimis in capitulum globosum arcte congestis vix compressis utrinque subalatis dorsoque carinatis stylo valido recto bialato apice sæpe uncinato terminatis. (TAB. I.)

Var. β. *pilosus*; minor, petiolis foliis scapis calycibusque magis pilosis, petalis linearibus sepalis ⅓ brevioribus, nectariis 3 valde distinctis.

Var. γ. *rhombifolius*; minor, foliis subrotundo-rhombeis 3–5-fidis segmentis subacutis crenato-dentatis v. integris.

HAB. Lord Auckland's group. α and β in boggy places on the hills, alt. 1000 feet; and from the sea to the mountain tops, alt. 1200 feet, in Campbell's Island. γ. Rocky places in Lord Auckland's group, alt. 1200 feet, rare.

Radix perennis, crassa, subpræmorsa, magis minusve elongata, fibros pallidos carnosos simplices, superne præcipue, emittens. *Folia* 1–2 unc. longa, 2–3 lata, omnia radicalia, patentia v. erecto-patentia, carnosula, crassa, pilosa (pilis deciduis), longe petiolata, reniformi-rotundata, radiatim venosa, basi lata subincurva, vel subrhomboidea, omnia pluri-lobata, lobis rotundatis magis minusve obtusis integris v. crenatis. *Petioli* 1–3 unciales, folio longiores, semiteretes, pilosi, basi latissime vaginati, vaginis striatis nervosis extus sæpe rigide fibrosis e reliquiis persistentibus vaginarum vetustarum, margine membranaceis. *Scapi* solitarii v. bini, rarius plures, erecti, crassi, foliis vix longiores, teretes, pilosi, 1- v. rarissime 2-flori, nudi v. 1–2-bracteati, bractea elongato-cuneata integra v. obtuse 1–2-dentata. *Flos* majusculus, unciam latus. *Calyx* 5- rarius 6-sepalus, sepalis patentibus, ovalibus, submembranaceis, purpureo-tinctis. *Petala* flava, purpureo-venosa, numero varia, 5–8–10, obovato-cuneata, v. lineari-spathulata, inæqualia, calyce breviora, medio nectarifera, nectariis e glandulis 3 depressis marginatis, in totidem nervos sitis. *Stamina* plurima; filamentis latis; antheris ovalibus obtusis. *Carpella* numerosissima, in capitulum globosum magnitudine *Coryli Avellanæ* nucis, glaberrima, lævia, ovata, nec compressa, dorso carinatis, lateribus alato-marginatis, alis ad apicem styli stricti uncinati rective decurrentibus.

A very handsome species, and quite distinct from any with which I am acquainted. It possesses, however, several of the peculiarities of other *Ranunculi* from the mountains of South America and the high southern latitudes, particularly in the variable form and number of the petals. In its succulent habit and undivided leaves it has an affinity with *R. Cymbalaria*, but is perhaps most nearly allied to *R. nivicola* (Hook. Ic. Pl. t. 571–2); especially as in one of our specimens the scape is bifid, 2-flowered, and bearing a large cauline leaf, thus showing a disposition in the plant to become caulescent. In the less divided foliage, shape of the petals, &c., it widely differs from that species, and more particularly in the curious nectaries which are only observable in the var. β, becoming evanescent in the larger and common state of the plant. Here they are large, and situated each about the middle of one of the three principal nerves, which seems to branch into three, the middle branch being continued through the nectary, while the lateral ones are thickened and run round its edge, all three uniting again at its summit. This circumstance may however be only caused by the thickened margin of the fovea, as the nerves do not appear branched in the petals of α, nor in those of intermediate states, where the nectaries are only perceptible as opake spots. These singular nectaries are also common to another scapigerous single-flowered species, the *R. Gunnianus* of Tasmania (Hook. Journ. Bot. vol. i. p. 244. t. 133), a plant which has also compressed or 2-winged styles,

PLATE I. *Fig.* 1, sepal; *fig.* 2 & *fig.* 3, petals; *fig.* 4, petal of var. β; *fig.* 5, stamen; *fig.* 6, ovarium; *fig.* 7, the same cut open:—all *magnified.*

2. RANUNCULUS (Hecatonia) *acaulis*, Banks et Sol.; pusillus, glaberrimus, sarmentosus, foliis omnibus radicalibus longe petiolatis cordatis ternatim sectis, lobis seu foliolis subpetiolulatis, obtusis, intermedio integro v. trifido, lateralibus integris v. inæqualiter bifidis, scapis solitariis petiolo brevioribus, sepalis 3–5 ovato-rotundatis, petalis 6–8 flavis late spathulatis obtusis calyce duplo longioribus medio squamuloso-nectariferis, capitulo globoso, carpellis paucis (5–7) ovatis gibbosis lævibus stylo recto brevi subulato terminatis. (TAB. II.)—*Banks et Sol. MSS. in Herb. Mus. Brit. DeC. Prodr.* vol. i. p. 34. *A. Cunn. Prodr. Fl. Nov. Zeal. in Ann. Nat. Hist.* vol. iv. p. 258.

HAB. Lord Auckland's group; moist places near the sea.

These specimens entirely agree with others gathered in the Bay of Islands, New Zealand: the plant apparently prefers, and is perhaps confined to, the immediate neighbourhood of the sea, and in this meridian has a range of 16 degrees of latitude at the level of the ocean. The only species to which it has any affinity is the *R. stenopetalus*, Hook. (Ic. Plant. t. 677), from Chili, to which it is very nearly allied; the difference in the comparative breadth of the petals being almost the only one I have been able to detect. The situation of the nectary on the petals near their middle is common to a large proportion of the species of this genus in the

Ranunculus acaulis. Bandes & Sol.

Fitch del.

prel. lith. Dinn. imp.

southern hemisphere, but very rare in those of the northern; the *R. parviflorus* being perhaps the only British one in which it is inserted at a considerable distance from their base. The foliage of this plant is sufficiently accurately described by DeCandolle from Sir Joseph Banks's New Zealand specimens, but the corolla requires some correction, and the fruit was unknown to that author. The calyx consists of from 3–5 membranous, very concave, deciduous sepals. Petals narrow, variable in number, about twice as long as the sepals, bright yellow, 1½ line long, spreading and horizontal in the expanded flower during the day, 3-nerved; nectary conspicuous, sunk, and covered with a closely appressed scale, forming together a deep fovea, opening upwards, placed on the middle of the petal and resembling the fructification of some *Davallia*. Filaments short, linear-subulate. Anthers broadly oblong. Ovaries about 15, some abortive, gibbous at the base, with a curved falcate style. Carpels forming globose heads, few in number, 5–8 or 10, rather large, compressed, especially towards the axis of the receptacle; the style straight or curved, very short or longer and subulate.

PLATE II. *Fig.* 1, bud; *fig.* 2, flower; *fig.* 3, sepal; *fig.* 4, petals; *fig.* 5, stamen; *fig.* 6, ovarium; *fig.* 7, head of carpels; *fig.* 8, carpel removed; *fig.* 9, vertical section of the same; *fig.* 10, lateral; and *fig.* 11, front view of seed:—all more or less *magnified.*

3. RANUNCULUS (Hecatonia) *subscaposus*, Hook. fil.; totus pilis subrigidis appressis fulvis hispido-pubescens, foliis plerisque radicalibus longissime petiolatis deltoideo-cordatis profunde tripartitis lobis late cuneatis inæqualiter 3–7-fidis segmentis acutis, scapis folio brevioribus unifloris 1–3-phyllis superne incrassatis et dense pilosis, petalis 5 calyce brevioribus obovato-oblongis infra medium squamuloso-nectariferis.—*Hook. Ic. Plant.* vol. viii. ined.

HAB. Campbell's Island; by the margins of rivulets in the woods, D. Lyall, Esq.

This plant I never saw growing; it was detected by my friend Mr. Lyall. In general appearance it very closely resembles the *R. lappaceus*, Sm., of Tasmania and the northern parts of New Zealand, a species which varies much in size, in the form of the leaves, and in the nature of the pubescence. The *R. subscaposus* is more slender in habit, with the hairs always closely appressed and of a tawny yellow colour; but the most important distinction lies in the form and size of the petals, which in *R. lappaceus* are much larger than the calyx and very broadly obovato-cuneate, with a large triangular fleshy nectary at the very base; but in this plant they are smaller, of a very different shape, and the nectary consists of a minute flat round scale placed a little below the middle. The petioles are nearly a span long; the leaves about an inch in length and somewhat more in width.

II. CRUCIFERÆ, *Juss.*

1. CARDAMINE *hirsuta*, L.; var. *subcarnosa*; glabra, floribus majusculis, petalis albidis purpureisve, stylis brevibus latis, stigmatibus subsessilibus.

HAB. Campbell's Island; very common on grassy banks from the sea to an altitude of 500 feet.

Abundantly gathered and used as a salad by the officers of the ships, its succulent leaves being an excellent antiscorbutic. A very dwarf hairy state of this is common among the rocks close to the sea, having the flowers always purple. Except in the very fleshy leaves, and, occasionally, coloured petals, this is in no way to be distinguished from the ordinary states of *C. hirsuta*, and especially from Cape Horn and Falkland Island specimens, in which the style and stigmata are variable both in length and breadth; in the large size of the petals it agrees with Icelandic and other hyperborean specimens. My friend Mr. H. C. Watson agrees with me in considering that no specific difference exists between this plant and our English *C. hirsuta*, though they grow nearly at the antipodes of each other. Of the stigmas in the European form, he observes, "they are broader

than the pods when in an early stage, but as the latter approach maturity, the stigmas shrink and dry. This change is not uniform in all English specimens."

2. CARDAMINE *corymbosa*, Hook. fil.; hirsutula v. glabra, caulibus perbrevibus rigidis ad basin ramosis, ramis gracilibus flexuosis diffusis parce foliosis, foliis longe petiolatis pinnatisectis, foliolis 3–5 subpetiolulatis rotundatis terminali majore, lateralibus remotis sæpe minutis, floribus corymboso-fasciculatis axillaribus v. terminalibus, corymbis nunc proliferis, pedicellis brevibus demum valde elongatis, siliquis anguste linearibus in stylum brevem attenuatis, replo angusto, valvis planis, stigmate minuto.—*Hook. fil. in Icon. Plant.* vol. vii. pt. 2. tab. 686.

HAB. Campbell's Island; on turfy ground near the sea, common.

Radix perennis, e fibris crassis, subfusiformibus, albidis, ramosis, descendentibus. Tota planta pilis sparsis patentibus hirsuta et ciliata, v. glabra. *Caulis* perbrevis, crassiusculus, albidus, rigidus, fragilis, fere ad collum ramosus; ramis 2–4 uncias longis, teretibus, gracilibus, patentibus, adscendentibus, subproliferim divisis. *Folia* perpauca, radicalia subnulla; ramea remota, longe petiolata, pinnatiscecta; foliolis 3–5, rotundatis seu late ovatis obovatis cordatisve, integerrimis, petiolulatis, terminali majore 3–4 lin. longo, lateralibus remotis sæpe minutis. *Petioli* graciles, 1–2 unciales, basi dilatati. *Flores* parvi, corymboso-fasciculati, axillares et terminales, nunquam, etiam fructiferi, racemosi. *Pedicelli* quandoque in axillis solitarii, primum brevissimi, demum valde elongati, unciam sesquiunciam longi, patentes. *Sepala* elliptica, ovata, venosa, purpurascentia. *Petala* calycem duplo superantia, obovato-spathulata, venosa, alba. *Siliqua* erecta, gracilis, stricta v. paululum curvata, $\frac{1}{2}$–$\frac{2}{3}$ unciam longa, anguste linearis, compressa, apice in stylum brevem crassiusculum subulatum attenuata. *Stigma* obtusum, vix stylo latius. *Semina* uniseriata, fusca. *Cotyledones* obovatæ. *Radicula* clavata.

This is a small and very distinct species of *Cardamine*, wiry and fragile in every part. The stems are short, or rather, at once, after springing from the collum, divided into spreading, ascending, filiform branches, with few and small leaves; and with corymbs, or more correctly speaking, fascicles of flowers, which at no period seem to constitute a raceme. Sometimes even the flower is solitary and axillary; generally several spring together from the side or apex of a stem, subtended by a leaf; sometimes a pedicel appears proliferous, running out into a stem and bearing a fascicle or corymb and a leaf at its apex: so that the inflorescence has little the appearance of that of a *cruciferous* plant.

3. CARDAMINE *depressa*, Hook. fil.; glaberrima, subacaulis, foliis confertis plerisque radicalibus longe petiolatis undique patentibus obovato-spathulatis obtusis inferne sinuato-lobatis, racemis breviter pedunculatis corymbosis petiolo brevioribus, siliquis longe pedicellatis erectis linearibus compresso-tetragonis stylo brevi attenuato mucronato terminatis. (TAB. III.)

Var. β. *acaulis*; foliis flaccidis tenui-membranaceis longissime petiolatis integris v. inferne subdentatis.—TAB. IV. B.

HAB. Lord Auckland's group; in gravelly moist places near the sea amongst grass. β. In clefts of rocks, alt. 1200 feet.

Radix brevis, subfusiformis, valida, fibrosa, superne multiceps. *Caules* brevissimi, ramis abbreviatis foliosis. *Folia* numerosa, conferta, undique patentia, v. superiora suberecta, petiolata, obovato-spathulata, glaberrima, subcarnosa, sinuata v. lobata lobis obtusis, rarius integra, una cum petiolo 1 unc. longa, 3–4 lin. lata. *Flores* parvi, subcorymboso-racemosi. *Racemi* abbreviati, plerumque e collo ipso orti, foliis 1–2 subtensi, terminales, rarius, ob ramos subelongatos, axillares, petiolo multo breviores. *Pedicelli* floriferi brevissimi; fructiferi elongati, graciles, adscendentes, 3 lin. ad $\frac{3}{4}$ unc. longi. *Sepala* concava, ovato-oblonga, obtuse trinervia. *Petala* anguste spathulata, albida, calycem plus duplo superantia. *Filamenta* compressa, inferne dilatata. *Siliqua* erecta, $\frac{1}{2}$–1-pollicaris, $\frac{3}{4}$ lin. lata, pedicello longior v. subæquilonga, linearis, compresso-tetragona, valvis pla-

Cardamine depressa. Hook. fil.

Fitch del.

prel. lith. Linn. imp.

Fitch del.

prel. lith. Linn. imp.

A. *Cardamine stellata.* Hook. fil.
B. *Cardamine depressa.* var β.

nis v. subtorulosis medio uninerviis; replo latissimo; stylo brevi angusto; stigmate parvo. *Semina* sub 20, testa rufo-fusca.

A very distinct species, which will come under the small section with undivided leaves, to which also the *C. bellidifolia*, L., of Northern Europe, belongs; a plant to which the present is unquestionably nearly allied. In both these species the leaves vary much, being sometimes, but rarely, almost entire in this, whilst in the *C. bellidifolia* they are more seldom sinuate or lobed. The very great breadth of the *septum*, which is winged on both sides, and forms an acute angle with the valves, is a most remarkable character, peculiar, as far as I am aware, to this and the following species; at times it is almost as broad as the valves themselves. In South America this form is represented by *C. chenopodiifolia*, Pers., which is however a larger and caulescent plant, with very conspicuous showy flowers,—a similar species, or perhaps variety, inhabits the Andes of Chili, at an elevation of 10,000 feet. The var. β was gathered in a very imperfect state with young flowers only. In general appearance it differs much from the normal form of the plant, and more especially in the flaccid membranous texture, long petioles, with shorter, rather broader, and nearly or quite entire leaves. It may prove distinct, but the specimens are not in a fit state for satisfactory determination.

PLATE III. *Fig.* 1, flower; *fig.* 2, sepal; *fig.* 3, petal; *fig.* 4, stamens and ovarium; *fig.* 5, stamen; *fig.* 6, siliqua; *fig.* 7, side-view of same; *fig.* 8, siliqua, with valve removed; *fig.* 9, seed; *fig.* 10, embryo:—more or less *magnified*.—PLATE IV. B. var. β.

4. CARDAMINE *stellata*, Hook. fil.; parva, acaulis, piloso-hispida, foliis confertis stellatim patentibus longe petiolatis elliptico-spathulatis integris v. inferne sinuato-pinnatifidis, floribus corymbosis, corymbis sessilibus, pedicellis gracilibus, siliquis abbreviatis linearibus compresso-tetragonis, replo latissimo, stylo brevi subulato. (TAB. IV. A.)

HAB. Campbell's Island; on the débris at the base of precipices in very exposed places.

Planta pusilla, depressa, plagæ inclementis typica, tota pilis albidis subhispida. *Radix* perennis, ad collum crassa, deinde fusiformis et fibrillosa. *Caulis* 0. *Folia* omnia radicalia, numerosa (circiter 15–20), horizontaliter et undique stellatim patentia, longe petiolata, una cum petiolo $\frac{1}{2}$–1 unc. longa, 2–3 lin. lata, ciliata, subcarnosa, e petiolo sensim dilatato-spathulata, v. elliptico-oblonga, obtusa, integra v. basi sinuato-lobata, seu pinnatifida, lobis obtusis. *Flores* corymbosi. *Pedicelli* elongati, e pedunculo brevissimo inter folia radicalia orti, hinc scapos sæpe simulantes, sub 3 lin. longi, erecti; fructiferi magis elongati. *Sepala* lineari-oblonga, obtusa, 3-nervia, extus pilosa. *Petala* $\frac{1}{2}$–$\frac{3}{4}$ lin. longa, obovato-spathulata, albida, calyce paulo longiora. *Antheræ* dorso glandula parva. *Siliqua* parva, erecta, $\frac{1}{4}$ unc. longa, pedicellum subæquans, compresso-tetragona, recta v. paululum curvata, pilosa v. glabra, gradatim in stylum angustum acuminata; valvis planis medio uninerviis; replo latissimo ut in *C. depressa*. *Semina* quoque loculo 6–8, rufo-fusca.

The habitat of this plant is remarkable, as it grows only in the most exposed situations on the weather shores, about 100 feet above the sea. In the form of the leaves it resembles the *C. pusilla*, Hochst., an Abyssinian species, but these are here more crowded and spathulate, and the inflorescence is quite different. The *siliqua*, though shorter, has very much the same form as that of *C. depressa*.

PLATE IV. A. *Fig.* 1, flower; *fig.* 2, sepal; *fig.* 3, petal; *fig.* 4, stamens; *fig.* 5, siliqua; *fig.* 6, seed:—all *magnified*.

III. CARYOPHYLLEÆ, *Juss.*

1. STELLARIA *decipiens*, Hook. fil.; glabra, caule decumbente dichotome ramoso, foliis recurvis omnibus (etiam supremis) petiolatis obovato-rhombeis acutis apice callosis carnosulis siccitate punctis minutis elevatis asperis, petiolis subciliatis, pedunculis di-trichotomis (rarius unifloris) folia

plerumque superantibus ad furcaturam pedicelloque unico medium versus 2-bracteatis, bracteis ovatis acutis scariosis albidis, petalis 5 bipartitis calycem æquantibus interdum eo brevioribus v. nullis filamentisque ima basi dilatatis fere hypogynis, stylis 3.—*Hook. fil. in Icon. Plant.* vol. vii. t. 680.

HAB. Lord Auckland's and Campbell's Islands; common on the low grounds, especially in the woods, and near the sea.

Caules tetragoni, e basi valde ramosi, filiformes, 3–5 unc. longi. *Folia* carnosula, 3–5 lin. longa, obovata seu rhomboidea, hinc inde, siccitate, minute tuberculata. *Petioli* 1–3 lin. longi, latiusculi. *Pedunculi* folio plerumque longiores, solitarii, raro uniflori, bifidi seu trifidi; ramis inæqualibus. *Petala* sæpe 0.

In many respects this agrees with the *S. uliginosa*, Murr., and more particularly in the size and arrangement of the inflorescence, but the stems are always decumbent, the leaves all petiolate, very patent or recurved, and not at all broader or ovate at the base; their callous apices are common to both species. The peduncles generally bear two pedicels, which have a pair of bracts at the base, and a pair on one of the pedicels, whereas in *S. uliginosa* the peduncle is trichotomously divided, with the intermediate pedicel only destitute of bracts. The styles seem to be constantly three, and the stamens and petals are less decidedly perigynous than in the latter plant. In form the leaves resemble those of *S. media*, With., but the inflorescence is very different, and the stem wants the alternate line of hairs.

2. STELLARIA *media*, With.—*Engl. Bot.* t. 537. *DeC. Prodr.* vol. i. p. 396. *Alsine, L.*

HAB. Lord Auckland's Islands; covering the tomb of a French sailor, and growing along with *Poa annua*, L.: undoubtedly introduced. A straggling, very common European form of the plant, still retaining all its characters.

IV. DROSERACEÆ, *DeC.*

1. DROSERA (sp.)?

HAB. Lord Auckland's group; on the hills.—Of this I only once met with a solitary specimen, scarcely in flower, resembling a good deal the *D. uniflora*, Willd., of Tierra del Fuego; but it was lost among the many botanical rarities brought down to the ship on that day, so that I am only able to record the fact of a species of the genus growing on the island.

V. GERANIACEÆ, *DeC.*

1. GERANIUM *microphyllum*, Hook. fil.; pusillum, adpresse pubescens, caulibus adscendentibus, foliis omnibus longe petiolatis orbiculari-reniformibus 5–7-lobatis, lobis trifidis subtus discoloribus, pedunculis lateralibus solitariis v. binis elongatis unifloris supra medium bibracteolatis, petalis (albis) obovato-cuneatis integris v. retusis, glandulis ad basin staminum fere obsoletis, filamentis ciliatis, stylis brevibus, ovario piloso. (TAB. V.)

HAB. Lord Auckland's group; in boggy places, alt. 1000 feet.

Radix perennis, multiceps, ad collum squamosa; squamis vaginantibus, ovatis, membranaceis, fuscis, nitidis. *Caules* ex eadem radice 3–4, 3–5 unc. longi, nudiusculi, decumbentes, deinde adscendentes, parce pilosi, crassitie pennæ passerinæ, internodiis remotis. *Folia* radicalia longissime petiolata, $\frac{1}{3}$ unc. lata, supra, et subtus (præcipue ad nervos) adpresse pilosa; lobis lato-cuneatis, obtusis, 3-fidis, segmentis latis acutis; læte viridia, subtus fusco-purpurea. *Petioli* graciles, filiformes, 2 unc. longi, basi stipulis vaginati, inferne

Fitch del. prel. lith. Finn. imp.

Geranium microphyllum. Hook. fil.

Fitch del et lith.

prel: lith: Imray.

Sieversia albiflora. Hook. fil.

glaberrimi, superne incano-pilosi. *Stipulæ* ovatæ, acuminatæ, rufo-fuscæ, scarioso-membranaceæ. *Pedunculi* uniflori, erecti, petiolo breviores, superne pilosi, supra medium bibracteolati; bracteis parvis, oppositis, ovatis, acuminatis. *Petala* $1\frac{1}{2}$–2 lin. longa, patentia, alba. *Stamina* 10, subæqualia; antheris oblongis.

In the single-flowered peduncles this is allied to the Tasmanian *G. potentilloides* of L'Héritier, but the plant is much more dwarfish, with short procumbent or ascending stems, less hairy, especially below, with the hairs appressed; the peduncles also are shorter than the leaves, which latter are less deeply cut.

PLATE V. *Fig.* 1, flower; *fig.* 2, petal; *fig.* 3, flower with the petals removed; *fig.* 4, underside of the calyx; *fig.* 5, portion of the stamens; *fig.* 6, ovaria:—all more or less *magnified.*

VI. ROSACEÆ, *Juss.*

1. SIEVERSIA *albiflora*, Hook. fil.; parvula, hirsuta, caulibus seu scapis parce foliosis tri-quinquefloris, foliis radicalibus interrupte lyrato-pinnatis, foliolis lateralibus minutis grosse dentatis, terminali maximo orbiculari-cordato obscure lobato inæqualiter dentato, caulinis subsessilibus, pedicellis superne incrassatis unibracteatis, bractea sessili trifida, calycis segmentis patentibus ciliatis, petalis (albis) obovatis retusis extus pilosis, ovariis in stylum brevem rectum (nec geniculatum) attenuatis in stipitem articulatis, receptaculo elongato gracili. (TAB. VII.)

HAB. Lord Auckland's group; rocky places on the hills, alt. 1000 feet.

I regret that owing to the early season I only met with two or three flowers of this rare plant, and not one specimen with perfect fruit. It is the smallest species known to me, and has a creeping, woody, subfusiform, oblique root, throwing out coarse fibres; and from the summits of this spring most of the leaves. The stems, or rather scapes (for they remain withered stalks after the fall of the fruit), arise also from the top of this root, and are branched, twice or thrice as long as the radical leaves: they bear a few flowers with white petals, which are succeeded by the narrow elongated receptacle, hispid as it were with the persistent stipites of the carpels. It is this character which it has in common with a very arctic species, the *S. Rossii*, Br., together with the very short styles, that induces me to place it in *Sieversia*; for the style seems too short ever to be geniculated. It further differs from all known species in having white petals.

PLATE VII. *Fig.* 1, unexpanded flower; *fig.* 2, expanded flower; *fig.* 3, petal; *fig.* 4 and *fig.* 5, stamens; *fig.* 6, young ovarium; *fig.* 7, receptacle after the carpels have fallen away:—all more or less *magnified.*

1. ACÆNA (Ancistrum) *Sanguisorbæ*, Vahl., *Enum.* vol. i. p. 294. *DeC. Prodr.* vol. ii. p. 592. *A. Cunn. Prodr. Fl. Nov. Zeal. in Ann. Nat. Hist.* vol. iii. p. 244. Ancistrum Sanguisorbæ, *Linn. fil.* A. anserinæfolium, *Forst. Gen.* t. 2. A. diandrum, *Forst. Prodr.* n. 52. A. decumbens, *Gærtn. Fruct.* t. 32.

Var. β. *minor*; depressa, ramis brevissimis, foliis valde sericeis. A. decumbens, *Menzies in Herb. Hook.*

HAB. Abundant in Lord Auckland's group and Campbell's Island, especially on cliffs overhanging the sea. β. On the mountains in rocky places. M^c^Quarrie's Island, *in Herb. Hook.*; also found in Dusky Bay by *Mr. Menzies.*

The ordinary states of this plant differ in no particular from other specimens gathered at the Bay of Islands. It is also a native of Tasmania, and probably of Southern Australia. *Stems* trailing, a span to two feet long. *Branches* erect or ascending. *Leaves* impari-pinnate, with 4–6 pairs of obovate or oblong, coarsely serrated, sessile leaflets, smooth on the upper surface, silky beneath, and more especially in the young plants, and in var.

β. at the apices of the serratures, which are there terminated by pencils of white hairs. *Flowers* capitate upon long slender peduncles. *Stigma* plumose.

2. Acæna (Ancistrum) *adscendens*, Vahl, *Enum.* vol. i. p. 297. *DeC. Prodr.* vol. ii. p. 593. Ancistrum humile, *Pers. Ench.* vol. i. p. 30.

Hab. M^c^Quarrie's Island. (*Herb. Hook.*)

This is perhaps the most common and widely diffused species of the genus, being found abundantly throughout Chili and Fuegia, as well as in the Falkland Islands and Kerguelen's Land. It may readily be distinguished by its large size, and by its smooth red-brown, often glaucous, decumbent stems. The leaflets are generally membranous, obovate or cuneate, $\frac{1}{3}$–$\frac{2}{3}$ inch long, coarsely inciso-serrate, glabrous on the upper surface, pubescent or almost silky beneath. The scapes or peduncles, bearing the globose capitula, are quite glabrous. The whole plant varies much in the size and toothing of its leaflets, whence I am inclined to think it may be the large and ordinary form of *A. Magellanica*, Lam.; although Vahl describes the peduncles of that plant as "*superne subvillosi.*" I further doubt how far the *A. ovalifolia*, Ruiz, and Pav. (*Fl. Per.* t. 103. f. *c.*), will prove distinct; it again is allied to the *A. Sanguisorbæ*, Vahl. The present form was not found either in Tasmania, New Zealand, or in Lord Auckland's or Campbell's Islands. The fact of its reappearance in a higher southern latitude is an interesting one, and in accordance with the known laws affecting the distribution of plants.

VII. ONAGRARIÆ, *Juss.*

1. Epilobium *linnæoides*, Hook. fil.; herbaceum glaberrimum caule repente vage ramoso, ramis divaricatis adscendentibus, foliis petiolatis cordato-rotundatis flaccidis argute dentatis, pedunculis solitariis axillaribus rarius terminalibus folio longioribus fructiferis sæpe valde elongatis, floribus erectis, sepalis apice glanduloso-apiculatis, petalis (roseis) calyce longioribus cuneatis profunde bifidis, stigmate indiviso clavato, fructibus glaberrimis erectis pedunculo brevioribus. (Tab. VI.)

Hab. Lord Auckland's group and Campbell's Island; abundant. Also more recently found amongst the mountains of New Zealand by *Mr. Colenso.*

A very pretty species, allied to the *E. nummularifolium*, R. Cunn., of New Zealand, but readily distinguished by its much larger size and thin, flaccid (not fleshy) leaves, which are strongly eroso-dentate. In Mr. Colenso's specimens the stems are longer, and the leaves less rounded in form with longer petioles. *Stems* weak, terete, 3–6 inches long. *Leaves* in rather remote pairs, bright green and shining above, often discoloured and purplish beneath, $\frac{1}{3}$–$\frac{1}{2}$ inch long, sometimes broader than long. *Petioles* 1–3 lines. *Peduncles*, even when flowering, very variable in length, from $\frac{1}{2}$–3 inches long, generally erect. *Sepals* concave, especially towards the apex, which is produced into a thickened, short, club-shaped apiculus or gland. *Petals* about half as long again as the sepals, $1\frac{1}{2}$ lin. long, of a pale rose-colour, bifid nearly half-way down. *Filaments* thickened at the connectivum. *Style* gradually swelling upwards into a club-shaped obtuse stigma. *Capsule* (which I have seen ripe only in the New Zealand specimens) narrow, erect, quite glabrous, about an inch long.

Plate VI. *Fig.* 1, flower spread open; *fig.* 2, petal; *fig.* 3, flower with the petals removed; *fig.* 4, front, and *fig.* 5, back view of a stamen:—all *magnified.*

2. Epilobium *confertifolium*, Hook. fil.; herbaceum, glabrum, caule repente radicante ramoso, ramis divaricatis decumbentibus teretibus cum lineis duabus oppositis incanis, foliis oppositis valde approximatis subimbricatis breviter petiolatis oblongo-obovatis obtusis subcarnosis glaberrimis remote

Fitch del.

prel. lith. Linn. imp.

Epilobium linnæoides. Hook fil.

et obscure dentatis, petiolis margine incanis basi connatis subvaginantibus, pedunculis sessilibus solitariis axillaribus, floribus erectis, petalis rubris subpurpureisve ad medium bifidis, ovario glaberrimo, stylo oblique clavato, capsula lineari elongata glaberrima.—*Hook. fil. in Icon. Plant.* t. 685.

HAB. Lord Auckland's group and Campbell's Island; on grassy banks and in moist places, abundant.

This little plant in every respect occupies the place in these islands, that the *E. alpinum*, L., does on the European mountains. The two species are indeed so very closely allied, that I look in vain for further constant characters than the creeping and rooting much-branched stem, the densely crowded, broader, and more obovate leaves with almost sheathing petioles, and the deeply bifid petals of the present one. The more remarkable points of similarity, besides the general appearance, are the lines of pubescence on the stem, the sessile or shortly pedunculated ovaria (which in *E. alpinum* are however often lengthened), the deep colour of the petals, and the simple clavate stigma, which is here decidedly oblique and gibbous at the base. A very similar species is found on the Andes of Peru and in Chili.

3. EPILOBIUM *nerterioides*, A. Cunn.; glaberrimum, caule repente radicante, foliis oppositis breviter petiolatis ellipticis rotundatisve subcoriaceis et carnosis marginibus integris recurvis, fructibus glaberrimis pedunculatis inclinatis pendulisve.—E. nerterioides, *A. Cunn. Prodr. Flor. Nov. Zeal. in Ann. Nat. Hist.* vol. iii. p. 32.

HAB. Lord Auckland's group; in moist rocky places, alt. 1200 feet, rare, not found in flower or fruit.

In these very imperfect specimens the leaves are much more fleshy, and their margins more strongly recurved, than in others gathered by Mr. Menzies in Dusky Bay, or by myself in the Bay of Islands. Like other species however of the same genus, the plant is probably a very variable one. Mr. Cunningham quotes the *E. pendulum*, Sol., as a synonym of *E. nummularifolium*, R. Cunn., a species very nearly allied to the present, but larger, with distinctly crenate leaves, and having the capsules hoary with a white down. In habit and foliage this plant resembles the *Anagallis tenella*, L., and as well as many of the New Zealand species, it has a peculiarly creeping mode of growth, which none of those of the northern hemisphere possess.

VIII. HALORAGEÆ, *Br.*

1. CALLITRICHE *verna*, L. *DeC. Prodr.* vol. iii. p. 70. *D'Urv. Fl. Ins. Mal. in Mém. Soc. Linn. Par.* vol. iv. p. 620. *Gaud. in Freyc. Voy. Bot.* p. 138.

Var. β. *terrestris*; caulibus brevissimis repentibus, foliis approximatis carnosis.

HAB. Lord Auckland's group and Campbell's Island; common on the ground and on wet rocks near the sea. β. On the ground by the margins of pools, Campbell's Island.

A very general plant throughout the Antarctic Islands visited by the "Erebus and Terror." First noticed as a native of the Falkland Islands by Admiral D'Urville, who, in his description of the plant, which is not uncommon there, and is identical with the var. β. of Campbell's Island, alludes to the filament and ovarium as each arising from a minute bipartite calyx. Neither in my dried specimens, nor when in a fresh state, could I detect organs answering to this description. The bracteæ, which are extremely caducous, and only exist in the very youngest state of the flower, are singularly falcate, linear-subulate and membranaceous, similar to those of *C. platycarpa*, Kützing. The leaves vary much in shape, and the whole plant in size, as in Europe. The anthers,

(though described as one-celled) are in reality didymous and 2-celled; they first open down each side and then across the connectivum at the top, always remaining partially 2-celled. Filaments often very long, half an inch and upwards. The styles are also slender, and when highly magnified exhibit throughout their length minute papillæ. Ovary (or female flower) 2–4-celled, pedicellate. The flowers are generally solitary; the males in the axils of the upper, and the females in those of the lower leaves, with a small abortive leaf-bud in the opposite axil.

IX. MYRTACEÆ, *Br.*

1. METROSIDEROS (Agalmanthus) *lucida*; arborea, foliis oppositis petiolatis ellipticis utrinque acuminatis integerrimis glaberrimis coriaceis rigidis enerviis inferne glanduloso-punctatis (glandulis luteis) marginibus revolutis, floribus 3–5 ad apices ramulorum breviter pedunculatis umbellatis, calyce turbinato sericeo, lobis late ovatis subacutis, petalis obovato-oblongis spathulatisve calycis limbo duplo longioribus apice ciliatis, filamentis petalo subtriplo longioribus.—*Menz. MSS. in Herb. Hook. A. Rich. Fl. Nov. Zeal.* p. 333. *A. Cunn. Prodr. Fl. Nov. Zeal. l. c.* vol. iii. p. 114. M. umbellata, *Cav. Ic.* vol. iv. tab. 337. *Smith in Rees's Cycl.* vol. xxiii. *DeC. Prodr.* vol. iii. p. 225. Agalmanthus umbellatus, *Hombr. et Jacq. Voy. au Pol. Sud, Bot.* tab. 1. *sine descript.* Melaleuca lucida, *Forst. Prodr.* n. 216.

HAB. Lord Auckland's group; from the sea to an altitude of 500 feet. Abundant. (Not seen in Campbell's Island.)

Originally discovered by Sir J. Banks and Dr. Solander at Totarra nui in the North Island of New Zealand, and a very fine drawing of it, made during Captain Cook's first voyage, is preserved in the British Museum. It was again found by Forster during Cook's second voyage, in Dusky Bay, and by him first published. Mr. Menzies also gathered it at the latter locality. I am at a loss to conceive how the specimens came into the possession of Felix Neè, from whose collection Cavanilles figured and described the plant under the name of *Metros. umbellata*, as a native of Port Jackson. The figure given by the latter author is very characteristic, except that the peduncles are represented as too long and slender. In the plate accompanying the late French expedition of Admiral D'Urville, the sketch of the entire plant does not do justice to that which constitutes the largest tree on Lord Auckland's group, and the most abundant, skirting the whole line of sea-coast with a broad belt of evergreen flat-topped forest wood. The single trees are from 20–40 feet high, inclined, with trunks 2–3 feet in diameter, often flattened, seldom erect, covered with a pale reddish bark, which flakes off like that of the birch. From the trunks and lower branches there are often sent out large tufts of dry root-like processes, which run along the surface, and are covered with a loose thick and spongy light brown cuticle. The branches are spreading and ascending, from the inclemency of the climate and violence of the winds forming stag-headed trees, whose tops are perfectly flat, as if cut with a scythe. The ultimate branches, which bear a few leaves, are angular and covered with a loose white papery cuticle, which turns yellow in drying. The leaves are of a lurid but shining green, more yellow on the under surface, and there covered with large yellow glands. Petals when young white with red tips, in the more expanded state crimson, as are the stamens. The inflorescence in this, as in all other New Zealand species, is in umbels or corymbs. The *Myrtaceæ*, which in North America do not attain a higher latitude than 26°, and in Europe only one reaches the 46th degree, in the southern regions are amongst the most Antarctic plants, being most abundant in Tasmania, lat. 42–44° S.; in New Zealand, throughout the islands as far as 50½° S., and in South America accompanying other plants as far as 56° S., where that continent terminates in the South Polar Ocean.

X. PORTULACEÆ, *Juss.*

1. MONTIA *fontana*, L. *DeC. Prodr.* vol. iii. p. 362. M. linearifolia, *D'Urv. Fl. Ins. Mal. l. c.* vol. iv. p. 619. M. lamprosperma, *Chamisso in Linnæa*, vol. vi. p. 565. t. 7.

HAB. Lord Auckland's group and Campbell's Islands; in moist places near the sea, abundant.

This is a very variable plant and an exceedingly common one in the southern regions. The specimens from the various Antarctic islands vary much in size, in the form of the leaf, in the number of the stamens, and in the number and nature of the surface of the seeds. Those of the Auckland and Campbell's Island specimens agree with the figure quoted of Chamisso's *M. lamprosperma*, but they are not larger than the seeds of European specimens. The Falkland Islands, form again has the seeds very large with a black tuberculated shining testa, agreeing in the latter character with those of Kerguelen's Land, which are however smaller. In the Peruvian plant the seeds are very small, but covered and almost echinate with crowded elevated linear tubercles. Those of the English plant are not constant in size, but the testa is generally more opake and not remarkably tuberculated. It is difficult to find a more widely distributed phænogamic plant than this, especially in the southern hemisphere, where it generally accompanies the *Callitriche verna*. In New Zealand and in Peru it inhabits a more elevated region. According to Boissier, it attains in Spain an altitude of 5000–7000 feet. In the Highlands of Scotland it ascends to 3000 feet, and reaches as far north as Iceland and Siberia in Europe and Asia. Though universally distributed over all the temperate parts of these two continents, and in the south, it appears to be singularly rare in North America, being hitherto detected only in Labrador, Greenland (whose Flora presents more European peculiarities than any other part of America east of the Rocky Mountains), Sitka and the Oregon.

1. COLOBANTHUS *subulatus*; dense pulvinatus nitidus, caulibus ramosis foliosis, foliis arcte imbricatis strictis rigidis subulatis coriaceis supra canaliculatis basi scarioso-membranaceis vaginantibus apicibus subpiliferis, floribus terminalibus solitariis, pedunculis folio brevioribus, sepalis 4–5 erectis inæqualibus lanceolatis striatis pungentibus, staminibus 4–5 filamentis basi in annulum perigynum coalitis, capsula 4–5-fida.—Sagina subulata, *D'Urv. Fl. Ins. Mal. l. c.* p. 618. S. muscosa, β. squarrosa et γ. laricifolia, *Sol. MSS. in Herb. Mus. Brit.* Colob. Benthamianus, *Fenzl, MSS. in Endl. Atakt.* t. 49. *Ann. Wien. Mus.* †49.

HAB. Campbell's Island; in rounded tufts on rocks near the summits of the hills, alt. 1000 feet.

Caules 1–1½ pollicares, ramosi, fastigiati, glaberrimi. *Folia* 1½–2 lin. longa, pallide viridi-straminea, erecto-patentia, basi connata. *Pedunculi* ¾ lin. longi, subangulati, validi. *Perianthium* folia vix superans et iis immersum, basi truncatum; sepalis basi incrassatis, in nostris exemplaribus 5, quorum 2 exterioribus paulo majoribus, 3 interioribus imbricatis. *Stamina* 5, rarius 4, manifeste perigyna, perianthii foliolis alterna; *filamentis* compressis, subulatis; *antheris* ovalibus. *Ovarium* ovatum, disco perigyno insertum, 1-loculare, sub 5-ovulatum. *Styli* 4–5. *Stigmata* lineari-clavata, intus glandulosa. *Capsula* ad medium 5-fida v. 4–5-partita, chartacea; segmentis obtusis, perianthio persistente inclusa. *Semina* 3–4, angulata, subreniformia, compressa; testa pallide brunnea, subtilissime granulata.

Of rare occurrence, and confined to the tops of the hills in Campbell's Island; nowhere seen in Lord Auckland's group. In the Falklands, and in Fuegia, where it was discovered by Banks and Solander, it is very common, both on the low grounds and on the mountains. I have followed Fenzl and Endlicher in placing this genus in *Portulaceæ*, though I must confess that to me it appears too closely allied to *Caryophylleæ*, and especially

to *Sagina*, to be far removed from that genus, while the habit is not that of any of this Order. The present plant differs from its congeners in being rigid and somewhat pungent; the structure of the flower however entirely agrees with that of the previously described species. All the specimens I have examined from this locality have a 5-sepalous perianth, which in the South American state of the plant is as invariably 4-sepalous. It is also apt to assume here a monstrous state, the central axis of the capsule becoming proliferous and sending out from the position of the placentæ (in the natural state) two foliaceous shoots, each with two pairs of leaves, projecting beyond the perianth, and the ovules (abortive) arranged round the bases of these shoots.

2. COLOBANTHUS *muscoides*, Hook. fil.; densissime compactus carnosus, ramis confertis foliosis, foliis arcte imbricatis patentim recurvis lineari-subulatis obtusis supra planis basi lata connatis, pedunculis brevissimis solitariis terminalibus superne incrassatis, perianthio herbaceo parvo compresso, sepalis 4 erectis lanceolatis obtusis concavis exterioribus majoribus dorso obscure carinatis, staminibus 4 per paria approximatis ex annulo perigyno incrassato ortis.

HAB. Lord Auckland's group and Campbell's Island; on wet rocks especially near the sea, and immediately above high-water mark.

The smallest species in regard to size of leaves and flower with which I am acquainted, and yet perhaps most nearly allied to the finest of the genus, a Kerguelen's Land species. The whole plant is densely matted and fleshy, forming compact tufts. Stems 3–4 inches long. Leaves 2 lines. The flowers are much compressed, very minute and inconspicuous, 1 line long, sunk among the leaves. Perianth of four erect sepals, of which the lateral are larger, more concave, and keeled at the back. Perigynous ring very conspicuous, and swollen into two large yellow fleshy glands between the bases of the stamens.

3. COLOBANTHUS *Billardieri*, Fenzl, *Ann. Wien. Mus.* 1. 48, *in not.* Spergula apetala, *Lab. Fl. Nov. Holl.* vol. i. p. 112. t. 182. *DeC. Prodr.* vol. i. p. 395. *Hook. fil. in Bot. Journ.* vol. ii. p. 410. Stellaria uniflora, *Banks and Sol. MSS. in Mus. Banks.*

HAB. Campbell's Island; on banks near the sea, scarce.

This species was originally discovered by Banks and Solander at Totarra nui, in the Northern Island of New Zealand, during Captain Cook's first voyage, and an excellent drawing of it, by Parkinson, is preserved in the Banksian collection. Labillardière afterwards detected it in Tasmania, whence Mr. Gunn sent beautiful specimens, in describing which I had occasion to notice its near affinity with the genus *Sagina*. Fenzl (*l. c.* according to Walper's Repert. vol. ii. p. 249) quotes the *Sagina crassifolia*, D'Urv., as a synonym of his *C. Billardieri*, and reduces the original plant of Labillardière to a variety, under the name of *β. procerior*. What I take for the plant of Admiral D'Urville, whose description (Mém. Soc. Linn. Paris, vol. iv. p. 617) is very characteristic, is much larger, of a different habit, and with truly linear very fleshy leaves, and is common in the Falklands, as well as the *C. Quitensis*, Bartl., which is closely allied to the *C. affinis* (Spergula affinis, *Hook. Icon. Plant.* vol. iii. t. 266). Labillardière says of the stamens of *C. Billardieri*, "sub pistillo inserta," but this is not the case with the specimens I have examined. They are clearly placed at the exterior of a membranous disc which surrounds the perianth, remote from the base of the ovary. The Campbell's Island specimens are very small, scarcely an inch high, whereas the Tasmanian are twice or thrice that size.

Plate XI.

Fitch del et lith.

Pozoa reniformis. Hook fil.

prel. lith. Linn. imp.

XI. CRASSULACEÆ, *DeC.*

1. BULLIARDA *moschata*, D'Urv., *Fl. Ins. Mal. l. c.* p. 618. *Gaud. in Freyc. Voy. Bot.* p. 138. B. Magellanica, *DeC. Bull. Philom.* n. 49. Tillæa moschata, *DeC. Prodr.* vol. iii. p. 382. *Hook. Icon. Plant.* t. 535. Crassula moschata, *Forst. Act. Goett.* ix. p. 26.

HAB. Lord Auckland's group and Campbell's Island; abundant on wet rocks immediately above high-water mark.

Petala patentia, obovato-cuneata, concava, albida, sæpe rubro-striata. *Filamenta* subulata, carnosa, siccitate compressa et ut videtur dilatata. *Squamæ hypogynæ* 4, carpellis oppositis et iis paulo breviores, cuneatæ. *Carpella* trigona, obovata, superne oblique truncata, dorso canaliculata: stylis brevibus, recurvis.

The geographical range of this species is wide, being found along the west coast of South America, from lat. 46° S. to Cape Horn, and also in the Falklands and Kerguelen's Land, but nowhere so abundantly as in this group. Notwithstanding the name given it by its discoverer, I was unable to detect any odour of musk or smell of any kind in the fresh plant.

XII. UMBELLIFERÆ, *Juss.*

1. POZOA, *Lag.*

Subgen. SCHIZEILEMA, *Hook. fil.* (*Involucrum 5–6-phyllum. Flores hermaphroditi.—Herbaceo-carnosa. Caulis repens nodosus.*)

1. POZOA *reniformis*, Hook. fil.; foliis longe petiolatis reniformibus multilobatis lobis latis retusis, petiolis basi vaginantibus, pedunculis petiolo brevioribus, involucri foliolis 3–4 linearibus, pedicellis 5–7 brevibus, calycis lobis late ovatis obtusis. (TAB. XI.)

HAB. Lord Auckland's group; clefts of rocks and amongst stones on the hills, alt. 1400 feet.

Herba pusilla, glaberrima, carnosa, facie *Hydrocotylis*, graveolens. *Caulis* crassitie pennæ passerinæ, longe repens, articulatus, nodosus, ad nodos cicatricatus, apice foliosus. *Folia* $\frac{1}{2}$–$\frac{3}{4}$ unc. lata, exacte reniformia, luride viridia, nitentia, radiatim venosa, lobis late rotundatis. *Petioli* 2–3 unciales; vaginis basi magnis latis, superne acutis. *Pedunculi* ex axillis foliorum, breves, semipollicares. *Pedicelli* vix 2 lin. longi. *Petala* parva, obovata, subacuta, medio late uninervia. *Stylopodia* superne truncata. *Fructus* oblongus, tetragonus; *mericarpiis* demum dorso canaliculatis.

A decidedly extra-tropical South American form, belonging to a section of the Nat. Ord. hitherto unknown to the Floras both of New Zealand and Australia. The remarkable similarity of the flower and fruit to those of the *P. coriacea*, Lag. (Hook. Bot. Misc. vol. i. p. 331. t. 66), together with the uniformity in the structure of its calyx and petals with that plant, have induced me to refer it to the same genus; but, from the difference in habit and the structure of the involucre of the species thus brought together, I have ventured to place this in a separate subgenus. The original species (*P. coriacea*), and the *P. hydrocotylifolia*, Bridges and Fielding (Sertum Plant. t. 40), have the flowers monœcious, a character I do not observe in this. The similarity which the present plant bears to the genus *Azorella*, Gaud., is in many respects close; the mericarps of this are hardly "parallelim biscutata," whilst those of *Azorella* are scarcely didymous. Though a very remarkable habit runs through most of the species of the latter genus, one of them, the *A. Ranunculus*, D'Urv., not only differs from its congeners in form and mode of growth, but in these respects much resembles this plant. In the

structure of the flower and fruit they totally differ, the former being truly an *Azorella*, and having the ciliated involucral leaves common to other species of that genus. The *Az. daucoides*, D'Urv. Fl. Ins. Mal. l. c. p. 613, is probably a true *Caldasia*, Lag.

PLATE XI. *Fig.* 1, flower; *fig.* 2, flower with the petals removed; *fig.* 3, petal; *fig.* 4, ripe fruit; *fig.* 5, transverse section of the same; *fig.* 6, front, and *fig.* 7, back view of seed; *fig.* 8, vertical section of the same showing the embryo; *fig.* 9, embryo removed:—all more or less *magnified*.

2. ANISOTOME, *Hook. fil.*

Flores dioici (seu polygami). *Calycis margo* 5-lobus; lobis (in flore steril.) patentibus, (in flore fert.) erectis, inæqualibus, persistentibus, 1–2 rarius 3 duplo longioribus lanceolatis, reliquis ovatis acutis. *Petala* obovata, acuta, v. acuminata, uninervia, brevissime unguiculata, patentia (lacinula inflexa nulla). MASC. *Stamina* æqualia. *Ovarium* nullum. *Stylopodia* magna, depressa. *Styli* deficientes. FŒM. *Fructus* ovali-oblongus, lobis calycinis erectis coronatus. *Mericarpia* subteretia, inæqualia, quinquejuga; jugis alte carinatis alatis lateralibus marginantibus; unico (seminifero) jugis lateralibus dorsalique majoribus, altero (abortivo) jugis lateralibus dorsalique minoribus. *Valleculæ* univittatæ, vittæ crassiusculæ. *Semen* sulcatum, testa atro-fusca.—Herbæ *subsuccolentæ, elatæ, altitudinis humanæ, in insulis* Auckland *et* Campbell *provenientes*. Caulis *erectus, crassus, fistulosus, sulcatus*. Folia *maxima, longissime petiolata, bi-tripinnatisecta*; segmentis *latis vel angustis, mucronato-cuspidatis, marginatis*. Petioli *basi ventricoso-vaginantes*. Umbellæ *amplæ, pluries compositæ*; vaginis *maximis vix foliiferis bracteatis*. Umbellulæ *globosæ*. Flores *numerosissimi, rosei v. pallide purpurei*. Involucra *et* involucella *polyphylla, foliolis lanceolatis æqualibus*.

1. ANISOTOME *latifolia*, Hook. fil.; foliis oblongis bipinnatisectis, segmentis obliquis ovato-oblongis imbricatis basi decurrentibus inæqualiter 3–5-fidis lobis acutis mucronato-aristatis pungentibus reticulatim venosis venis depressis, superioribus confluentibus. (TAB. VIII., and TAB. IX. & X. B.)

HAB. Lord Auckland's group and Campbell's Island; in moist places from the sea to the tops of the mountains, abundant.

This is certainly one of the noblest plants of the natural order to which it belongs, often attaining a height of six feet, and bearing several umbels of rose-coloured or purplish flowers, each compound umbel as large as the human head. The foliage is of a deep shining green, and the whole plant emits, when bruised, an aromatic smell. The female flowers I have only seen in a specimen gathered by Mr. Lyall in Campbell's Island. They are of a peculiar structure, and show a striking affinity between this plant and the *Aciphylla squarrosa*, Forst. (Hook. Icon. Pl. vol. vii. t. 607, 608), especially in the unequal mericarps. Both the male and female flowers vary in the size of the calycine segments, which are however constantly unequal, one or more being much the largest and longest. In the male the styles are reduced to mere points on the inner margin of the depressed purple stylopodia; in the female the latter organs are conical, and terminate in long stout recurved styles, capitate at the extremity: this structure is common to *Aciphylla*, according to Forster's figure (Genera, t. 68). In the description of the genus I have described what may be considered the normal form of the fruit, but it is liable to much variation, and the five ridges are seldom fully developed in both mericarps. The five lobes of the calyx always give origin to as many larger ridges, and these again vary in size according to the number of large lobes: the most fully developed segment of the calyx, whether lateral or dorsal on the mericarp, always being opposite to the larger ridge. Very generally there are three large lobes to the calyx (of the female flower), one near the back of one mericarp, and two lateral on the other; that with three has then five ridges, two large lateral, one (also large dorsal), and two intermediate smaller: the mericarp with only one large lobe has only four ridges; two lateral (one of which is from the small lobe and largest of these two), the other very large, from the larger tooth. These mericarps are about two lines long, of a fuscous yellow colour, are obscurely glandular, and the

BOMBAY BRANCH OF THE ASIATIC SOCIETY

Plate VIII.

Fitch del et lith.

prel. lith. Linn. imp.

Anisotome latifolia. Hook fil.

Anisotome antipoda B. et Ch. Al.

vittæ extend through their whole length. The seed hangs loose in the cell, is small, and covered with a rather thick blackish testa; its sides have furrows corresponding to the valleculæ.

PLATE VIII. A small flowering portion of the plant, with the limb of the leaf; *Fig.* 1, unexpanded male flower; *fig.* 2, the same expanded; *fig.* 3, calyx and stylopodia:—the dissections *magnified.*

PLATE IX. & X. B. *Fig.* 1, partial umbel of ripe fruit of natural size; *fig.* 2, a single fruit removed from the umbel; *fig.* 3, transverse section of the same, showing the inequality of the mericarps, one of which is empty with five ridges, the other fertile with four ridges:—all the dissections *magnified.*

2. ANISOTOME *antipoda*; foliis lineari-oblongis tripinnatisectis segmentis teretibus divaricatis lineari-subulatis rigidis pungentibus striatis intus præsertim ad furcaturas transversim articulatis, rachibus superne canaliculatis. (TAB. IX. & X.)—Ligusticum antipodum, *Hombr. et Jacq. Voy. au Pol Sud, Bot. Phaner.* tab. 3. *sine descript.*

HAB. Lord Auckland's group and Campbell's Island; in moist places especially near the sea, and in the former islands ascending to the mountain tops in a more stunted form.

A scarcely less handsome plant than the former, with which it agrees entirely in habit, and more particularly in the structure of the male flowers. The umbels are however less densely crowded, borne on longer peduncles, and produce fewer partial umbels and flowers. I was unfortunate in not being able to detect female flowers, nor have I seen any nearer approach to that state of the plant than the occasional presence, amongst the flowers of the ray, of stylopodia and styles analogous to those of the female of the former species. The fruit of this plant is represented in the 'Botany' of the French Voyage of Discovery quoted above, but in it the mericarps are figured as equal, and the vittæ are probably accidentally omitted; so very singular a character as the former may have been overlooked in the dry state of the plant; the glands, which are very obscure in the former species, are in this very large and apparently confined to one side of each mericarp: a remarkable similarity, however, exists in the furrowed seeds and in the stylopodia of the two species. The lamellæ in the fistular portion of the stem are not represented, and the sketch of the entire plant bears but a slight resemblance to the state in which we drew it.

In structure, the fructification of this genus is more closely allied to *Aciphylla*, Forst., than its general appearance would lead one to suppose. The figure of that plant (in the Icones Plant.) was taken from a specimen in fruit, the only state in which we possessed it previous to the arrival of Mr. Stephenson's New Zealand collection (vide Lond. Journ. of Bot. for September 1844), which contains small portions of apparently this plant (n. 81) in flower. In it the partial umbels are few-flowered, with the peduncles divaricating; they are borne on axillary branches, subtended by a sheathing, lanceolate, acuminated, pungent involucral leaf; towards the apex of the stem these branches are more crowded, and the involucral leaves are lengthened and become bifid or even trifid. The calycine segments are very small, broad, obtuse, and nearly equal in size. The petals (apparently pale yellow), though more incurved than in *Anisotome*, are scarcely furnished with an "inflexed lacinula"; the stamens, stylopodia and styles are very similar in the two genera. The female flowers are probably more densely aggregated than the male, and in the inflorescence of the former the involucral leaves may rapidly assume the curious form represented in the 'Icones,' or Mr. Stephenson's specimens may belong to a different species, for certainly their mode of inflorescence bears little resemblance to the dense cylindrical female spike of the *A. squarrosa*. Both these genera will naturally rank near *Ligusticum*, from which they are however very distinct, and may be considered as forming a small natural group. What I am inclined to consider as a third species of *Anisotome* is the *Ligusticum anisatum*, Banks and Sol. MSS. in Mus. Brit.; a plant discovered by Sir J. Banks and Dr. Solander in Queen Charlotte's Sound, and a fourth has been since gathered in Cook's Straits by Dr. Dieffenbach, and on the high mountain of Tongariro by Mr. Bidwill; both these gentlemen's specimens are male. The *An-*

gelica ? rosæfolia, Hook. Ic. Plant. t. 581 (*Ligusticum aromaticum*, Banks and Sol. Ic. in Mus. Brit.), is also in some measure allied to these, though a plant of a very different habit; its calycine segments are decidedly unequal in size, and one of the two mericarps is often abortive.

In the three known species of *Anisotome*, all the parts connected with the inflorescence are subject to much irregular metamorphosis and monstrous development, the more important of which, as observed in the living plants of *A. latifolia* and *A. antipoda*, are the following:—1st, the segments of the partial involucra become shrivelled, assuming the forms of peduncles, and bear at their apices stylopodia with distorted calycine segments, or more perfect flowers with a reduced number of parts; or, in one case, a solitary one-celled anther, full of pollen, adnate on the face of the leaf, a little below its apex: 2nd, the peduncles themselves of the outer flowers become foliaceous, or by dividing show a tendency to a further compound state of the umbel; it also sometimes bears a single stamen at its apex, subtended by one large calycine segment: 3rd, the calycine segments vary from 2–6, but one or more are always so much larger than the others, as often to resemble involucral leaves: 4th, the petals are wanting, or vary from 1–6; sometimes two are combined into one; at others they assume various shapes: 5th, the stamens are equally variable in number; the filament is at times petaloid, or becomes forked and bears a second anther; these are constantly perfect and full of pollen: 6th, the stylopodia are always 2 or more, often 3, generally of the plane depressed form common to the male flowers; but the flowers of the ray sometimes bear 2–4 of entirely a different form, and similar to those of the fertile umbels; these are sometimes accompanied with stamens:—generally no numerical relation can be traced between the parts of these irregularly developed flowers. That such a relation however exists is demonstrable in a very distorted example, where a flower was furnished with 6 calycine segments, 3 very large and the others very small, 2 petals, 6 stamens, one of which bore two perfect anthers, and 2 stylopodia, in all 17 parts, the normal number in the ordinary state of the plant. Perhaps the most complex example was exhibited in one of the outer pedicels of a partial umbel, which was terminated by 4 stylopodia surrounded by a 5-toothed calyx, the latter subtended on one side by 4 linear, foliaceous, very imperfectly developed organs, each of them furnished at its apex with an obscure depression filled with yellow powder. It here appears to me that the apparent pedicel is the peduncle of a partial umbel bearing one sessile female flower, and that the three superadded foliaceous organs represent the pedicels of male flowers, which are reduced to as many foveæ containing pollen, a most rudimentary state of the male flower. I did not observe whether the stylopodia were internal or external in relation to the axis of the plant and the three supposed male pedicels; probably however the latter, as it is the flowers of the ray which generally bear female stylopodia.

Plate IX. & X. *Fig.* 1, flower; *fig.* 2, calyx with the petals removed; *fig.* 3, a petal; *fig.* 4. front, and 5, back view of stamens; *figs.* 6, 7, 8 and 9, portions of umbel and flowers distorted by monstrous development:—all *magnified.*

XIII. ARALIACEÆ, *Juss.*

1. Panax *simplex*, Forst.; arborea, inermis, foliis elliptico-lanceolatis subacutis obtusisve grosse serratis longe petiolatis cum petiolo articulatis (junioribus trifoliolatis), umbellis floralibus subracemosis fructiferis parce ramosis rarius simplicibus, umbellulis 6-10-floris. (Tab. XII.)—P. simplex, *Forst. Prodr.* n. 399. *DeC. Prodr.* vol. iv. p. 253. *A. Rich. Fl. Nov. Zeland.* p. 281. t. 31. *A. Cunn. Prodr. Fl. Nov. Zel. in Ann. Nat. Hist.* vol. ii. p. 213.

Hab. Lord Auckland's group; from the sea to alt. 500 feet, abundant.

A very scarce plant, and hitherto only found in the southern extremity of New Zealand and the Antarctic

BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

Plate XII.

Fitch del et lith.

prel. lith. Lann Imp.

Panax simplex Forst.

islands beyond it. As far as I am aware, it had been previously gathered by Forster alone. In this group it attains a height of 30 feet, amongst other trees near the sea. Its trunks are sometimes 2–3 feet in diameter, covered with a smooth brown bark; the wood is white and close-grained. Branches much scarred, and clothed with a pale bark, very brittle. The distinct joint at the apex of the petiole indicates the truly compound nature of the leaves; they are nowhere described as ternate; a character which all young trees of this species exhibit. The whole plant has a faint but rank smell, like that of Ivy, which the copious lurid green but shining coriaceous leaves much resemble, both in hue and texture. The involucral leaves are very small and subulate.

PLATE XII. *Fig.* 1, unexpanded flower; *fig.* 2, flower more expanded; *fig.* 3, petal from the same; *fig.* 4 and *fig.* 5, immature stamens; *fig.* 6, germen after the petals have fallen away; *fig.* 7, immature fruit; *fig.* 8, vertical, and *fig.* 9, horizontal section of the same; *fig.* 10, ovule:—all *magnified.*

1. ARALIA *polaris*, Hombr. et Jacq.; polygama, herbacea, inermis, tota setis mollibus laxis obsita, foliis (maximis) longe petiolatis orbiculari-reniformibus basi profunde cordatis marginibus multilobatis lobis 3–5-dentatis dentibus subacutis, umbellis copiosis compositis partialibus multiradiatis globosis, involucris foliaceis, floribus densis, fructibus depresso-sphæricis exsuccis suberosis atris nitidis.—A. polaris, *Hombr. et Jacq. in Voy. au Pol Sud, Bot. Phaner.* t. 2. *sine descript.*

HAB. Lord Auckland's group and Campbell's Island; in the woods and on banks, generally near the sea, but often attaining an altitude of 600–700 feet, covering large tracts of ground with its bright and shining green foliage.

Radix; rhizoma cylindraceum, elongatum, 2–3-pedale, ad terræ superficiem procumbens, transversim striatum seu annulatum, solidum, ochraceum, subtus fibras copiosas breves emittens. *Tota planta* setis mollibus patentibus simplicibus subcarnosis vestita. *Caules* herbacei, validi, 2–4-pedales, e collo ipso valde ramosi, sæpius prostrati vel adscendentes, teretes, striati, fistulosi, diametro 1–1½ unciam, pallide flavido-virides. *Folia* pleraque ad furcaturas ramorum, inferiora majora longius petiolata, horizontaliter explanata, 1–1½ ped. lata, crassa, carnosa, orbiculari-reniformia, flabellatim nervosa atque reticulatim venosa, utrinque, precipue subtus et ob nervos prominentes setosos rugosa, læte viridia, nitida. *Petioli* erecti, semiteretes, bipedales et ultra, basi membranaceo-vaginati; *vaginæ* semi-amplexicaules, superne (ut in plantis gramineis) in ligulam maximam membranaceam obovato-cuneatam expansæ; *ligula* superne truncata, bifida seu bipartita, laciniata, 2–3 unc. lata, pulcherrime radiatim et reticulatim venosa. *Umbellæ* terminales et axillares, compositæ, maximæ, diametro capitis humani, ter quaterque divisæ. *Umbellæ* partiales numerosæ, globosæ, multifloræ, diametro 1–2 unc. *Involucra* polyphylla: *involucella* oligophylla; ultima monophylla, gradatim minora, omnia longe petiolata, radiis umbellæ multoties longiora, folia caulina juniora simulantia, sed pluries minora, angustiora, sæpe cuneata, altiusque lobata; umbellulorum ultimorum sæpius ad squamas ciliato-fimbriatas redacta. *Pedicelli* florum breves, clavati, ⅓–½ unc. longi, sulcis tot quot ovarii exarati, florum masculorum graciliores. *Flores* copiosissimi, polygami, in capitulum globosum arcte congesti, pallide flavidi, cereacei, subtranslucentes, nitentes, disco purpureo. *Calycis tubus* cum ovario adnatus, 3–4-sulcatus, margine integerrimo. *Petala* 5, ante expansionem late ovata, obtusa, deltoideo-reniformia, subunguiculata, demum patentia, oblongo-obovata, carnosa, cellulosa, enervia, 1–1½ lin. longa. FL. MASC. *Stamina* 5; *filamenta* brevia subulata, paululum incurva; *antheræ* majusculæ, didymæ, purpureæ: *pollen* elliptico-oblongum, utrinque obtusum, sub lente lineis 1–2 longitudinalibus opacis notatum, hyalinum, in cumulo stramineum. *Stylopodia* plana, depressa; *styli* nulli. FL. FERT. *Stamina* ut in fl. masc., aut nulla. *Stylopodia* 3–4, subreniformia, elevata, sursum plana, luride purpurea, granulata, cavitatem in axin ovarii cingens. *Styli* 3–4, breves, subulati, lineares, subacuti, recurvi. *Ovarium* carnosum, 3–4-sulcatum, late turbinatum, 3–4-loculare, loculis circa axin cavum dispositis, 1-ovulatis; *ovula* ex apice loculi anguli interioris pendula, pyriformia, anatropa, funiculo brevissimo. *Fructus* subbaccatus, suberosus, aterrimus, depresso-globosus, recens 3 rarius 4-sulcatus, in caulibus emortuis fibrosis dealbatis anni præteriti persistens, disco vacuo

superne concavo; *epicarpium* crustaceum; *endocarpium* corneum v. osseum; *sarcocarpium* suberosum. *Loculi* 3–4, valde compressi, axi contrarii. *Semen* parvum, late ovato-ellipticum, plano-compressum, versus axin obtuse angulatum, loculum totum implens. *Testa* membranacea, pallide fusca. *Albumen* copiosum, farinaceo-corneum, albidum. *Embryo* minutissimus, pyriformis; *radicula* supera, hilo proxima; *cotyledones* breves, divaricatæ, obtusæ.

One of the most handsome and singular of the vegetable productions in the group of islands it inhabits, which certainly contains a greater proportion of large and beautiful plants, relatively to the whole vegetation, than any country with which I am acquainted. Growing in large orbicular masses, on rocks and banks near the sea, or amongst the dense and gloomy vegetation of the woods, its copious bright green foliage and large umbels of waxy flowers, often nearly a foot in diameter, have a most striking appearance. The pretty black berries on the white and withered stalks of the former year's umbels form a curious contrast to the shining waxy appearance of the rest of the inflorescence. The whole plant has a heavy and rather disagreeable rank smell, common to many of its Nat. Order, but is nevertheless greedily eaten by goats, pigs and rabbits.

Beautiful as is the plate of *Aralia polaris* in the French South Polar Voyage above quoted, and faithfully as it represents the leaf and umbel, the insertion of both immediately upon the rooting stem, without the intervention of branches, and the absence of the great ligules, are quite unlike what is exhibited by my specimens. It is possible that the letter-press may account for this and some other apparent inaccuracies; but although the plates have been in our possession for nearly a twelvemonth, I cannot learn that any descriptive matter has hitherto appeared.—The above particulars of the plant, and the analysis, were drawn up from living specimens; and although the drawings, made at the same time from the recent plant, are not of sufficient novelty to justify their introduction amongst the plates of the present work, I have deemed it desirable to give them in the 'Icones Plantarum' (vol. viii. tab. 701. ined.).

XIV. RUBIACEÆ, *Juss.*

1. COPROSMA *fœtidissima*, Forst.; arborea, glaberrima, foliis petiolatis exacte elliptico-oblongis obtusis apicibus vix mucronatis, floribus terminalibus solitariis, baccis subrotundis sessilibus.—(TAB. XIII.) C. fœtidissima, *Forst. Prodr.* n. 138. *DeC. Prodr.* vol. iv. p. 578. *A. Rich. Flor. Nov. Zel.* p. 261. *A. Cunn. Prodr. Flor. Nov. Zel.* l. c. vol. ii. p. 206.

HAB. Lord Auckland's group; in the woods near the sea, also ascending in the valleys to 900 feet.

This is a perfectly distinct plant, though confounded by Cunningham (as his specimens in Herb. Heward prove) with the *C. lucida*, Forst. It is probably a very abundant species in the middle and southern islands of New Zealand, where, however, it had until quite lately been gathered by Forster alone, in Queen Charlotte's Sound. It has been more recently detected on the mountainous interior of the Northern Island by Mr. Colenso, whose specimens (n. 117) are rather less robust, with the leaves narrower and more membranaceous. It is one of the few large-leaved species with truly solitary and sessile flowers and berries. In this group of islands it often attains a height of 20 feet, with a trunk 1½ foot in diameter. The whole plant, especially when bruised or when drying, exhales an exceedingly fetid odour, much resembling that of the flowers of *Hibbertia volubilis*. I brought on board the "Erebus" specimens of this with other plants, late one evening, and finding that there were more tender species, which took a considerable time to lay in paper, than I could well get through that night, I locked this *Coprosma* in a small close cabin until I should have leisure to press it, but before half an hour had elapsed the smell was intolerable, and had pervaded the whole of the lower deck. The leaves, though very constant in form, vary much in size, and in the alpine specimens are scarcely more than ½–⅓ inch long.

ROYAL ASIATIC SOCIETY OF THE BOMBAY BRANCH OF THE

Fitch del et lith.

prel. lith. Linw. imp.

Coprosma fœtidissima. Forst:

OF THE
BOMBAY
BRANCH
OF THE
ASIATIC

Coprosma affinis Hook. fil.

LIBRARY OF THE BOMBAY BRANCH OF THE ASIATIC SOCIETY

Fitch del et lith.

Coprosma cuneata. Hook fil.

prel lith. Kinn ing.

PLATE XIII. *Fig.* 1, longitudinal section of a ripe berry showing the nucules; *fig.* 2, lateral, and *fig.* 3, back view of a nucule removed; *fig.* 4, longitudinal section of do.; *fig.* 5, front, and *fig.* 6, lateral view of the seed removed from the nucule; *fig.* 7, longitudinal section of seed, showing the embryo; *fig.* 8, cotyledons:—all *magnified.*

2. COPROSMA *affinis*, Hook. fil.; arborea, glaberrima, foliis petiolatis elliptico-lanceolatis acutis, floribus terminalibus solitariis sessilibus. (TAB. XIV.)

HAB. Lord Auckland's group; in low woods near the sea.

This plant, which I found only in the state of young fruit, is so nearly allied to the preceding, that it is not without much hesitation I retain it as a distinct species, which I do on the ground of there being, in a large suite of specimens of *C. fœtidissima*, none with the leaves intermediate in form between that species and the present. It may be readily recognised by the larger and longer leaves, which are decidedly acuminated at the apex: its season of flowering too seems to be different.

PLATE XIV. *Fig.* 1, an immature berry:—*magnified.*

3. COPROSMA *cuneata*, Hook. fil.; fruticosa, glabra, ramis attenuatis rigidis, ramulis pubescentibus, foliis fasciculatis parvis rigidis coriaceis anguste cuneatis apice emarginato-truncatis sessilibus enerviis subtus pallidioribus, stipulis apice barbatis, floribus solitariis, fructibus in ramulis ultimis terminalibus solitariis globosis. (TAB. XV.)

β. foliis longioribus, apice rotundatis.

HAB. Lord Auckland's group and Campbell's Island; in woods near the sea. β. In ravines at an altitude of 900 feet on the former, and near the sea in Campbell's Island.

The investigation of the genus *Coprosma*, and especially of the small-leaved species, is attended with very great difficulty. Those of the extreme southern parts of the New Zealand group seem different from such as inhabit the northern islands, and these again from the Australian and Tasmanian kinds. In each locality, however, the forms seem so protean, that more than words is required to assist in their determination, whilst the paucity of specimens hitherto received has obliged botanists to separate dissimilar specimens of what a more copious supply might prove to belong to the same plant. It is to avoid any further confusion that I have ventured to figure three species, of which I have no materials for such an analysis of the flower and fruit as a good botanical drawing should possess. The *C. cuneata*, in its ordinary form especially, appears one of the most distinct of these, and has the leaves invariably very blunt, larger at the upper extremity, and then retuse or decidedly notched: they are rigid and coriaceous in texture, and very uniform in size. In the woods near the sea it forms a remarkably harsh, woody, and repeatedly branched shrub, whose stems are often 2 inches in diameter at the base, and covered with a rough black bark. The pale, but bright, red of the berries, which are abundantly produced, forms a very pretty contrast amongst the deep shining foliage.

PLATE XV. *Fig.* 1, ripe berries; *fig.* 2, longitudinal transverse section of do.; *fig.* 3, nucules removed from the berry; *fig.* 4, transverse section of a nucule; *fig.* 5, front; and *fig.* 6, side view of seed; *fig.* 7, longitudinal section of do. showing the embryo:—all *magnified.*

4. COPROSMA *myrtillifolia*, Hook. fil.; fruticosa, ramulis pubescenti-cinereis, foliis subfasciculatis parvis lato-lanceolatis subcarnosis brevissime petiolatis acutiusculis glabris subtus obscure nervosis, baccis solitariis.

HAB. Lord Auckland's group; in ravines about 600 feet above the sea.

A small and almost leafless bush, which, like its congeners, is very apt to vary in its mode of growth. In the ordinary state it grows 3–4 feet high, and from the lower parts of the stems and branches being bare of

leaves, it assumes a spiny appearance. The leaves are patent, $\frac{1}{3}$–$\frac{1}{2}$ inch long, scarcely coriaceous; the stipules hairy and ciliated at the margins.

5. COPROSMA *ciliata*, Hook. fil.; fruticosa, ramis pilosis, foliis oppositis solitariis vel fasciculatis submembranaceis elliptico-lanceolatis obtusis v. subacutis basi in petiolum perbrevem attenuatis ciliatis, petiolo costaque subtus præcipue hirsutis, stipulis apice barbatis.

β. virgata, laxe foliosa, ramis virgatis tenuibus.

HAB. Lord Auckland's group; in ravines, alt. 500–1000 feet. *β.* In Campbell's Island, in shady situations near the sea.

A common shrub, especially in Lord Auckland's group, where it forms a densely branched bush, growing from 8–10 feet high. The Campbell's Island specimens again are very lax, twiggy, and sparingly leafy; and the leaves, which in *α.* are $\frac{1}{2}$–$\frac{2}{3}$ inch long, are in *β.* generally under that size. I have seen neither flower nor fruit. The bushes of the various species of *Coprosma* compose a dense and impenetrable thicket, on the margins of the narrow gulleys formed by water-courses on the faces of the hills. Becoming stunted and much branched from the violence of the perennial gales, they offer as powerful an obstacle to the traveller here as the beeches do in Tierra del Fuego. In both cases it is almost equally impossible to penetrate them; but, extraordinary as it may appear, their branches are so gnarled and densely matted, that their flat summits will often bear the human weight, and almost admit of walking upon them.

6. COPROSMA *repens*, Hook. fil.; fruticulosa longe repens ramosissima glaberrima, ramis ramulisque brevibus, foliis parvis coriaceo-carnosis rigidis ovatis in petiolum brevem latiusculum attenuatis supra planis v. concavis subtus convexis, stipulis brevibus obtusis carnosis una cum petiolis connato-vaginatis, floribus solitariis terminalibus baccis 2—4 pyrenis. (TAB. XVI.)

HAB. Lord Auckland's and Campbell's Island; common from the sea to the tops of the hills.

Caules pedales et ultra, vage repentes, fibras tenues ramosas ad axillas foliorum emittentes, cortice cinereo spongioso sæpe obtecti, crassitie pennæ passerinæ. *Folia* breviter petiolata, horizontaliter patentia, conferta, crassiuscula, ovata v. elliptica, obtusa, concava, nitida, enervia, sub. 3 lin. longa. *Stipulæ* late ovatæ, obtusæ, glaberrimæ. *Flores* ad apices ramorum solitarii, sessiles, verosimiliter dioici. *Calycis limbus* profunde 4-partitus; segmentis lineari-ovatis obtusis. *Corolla* (in exemplaribus Tasmanicis solummodo mihi visa) tubulosa, subcampanulata, paululum curvata; tubo elongato, ore quadrifido; segmentis ovatis, subacutis. *Stamina* 4; *filamentis* longissimis, exsertis; *antheris* majusculis, pendulis, linearibus, ungue uncinato terminatis. *Styli* 2, longe exserti, pubescentes. *Bacca* (in exempl. Aucklandicis) subglobosa, omnino sessilis, diametro 3 lin., pallide vel intensius rubra, carnosa et aquosa, intus 2-4-pyrena. *Nuculæ* crustaceæ, 1-loculares, 1-spermæ, unica v. duobus $\frac{1}{3}$. majoribus. *Semen* erectum; *testa* fusca, membranacea; *albumine* carnoso. *Embryo* majusculus; *radicula* hilo proxima, elongata, terete; *cotyledonibus* latis.

This plant is apparently identical with a species collected on Middlesex Plains, Tasmania, by R. C. Gunn, Esq.; a remarkable circumstance, as its low, procumbent mode of growth gives it the appearance of being an Antarctic form of the genus. The Auckland Island specimens I gathered with young and ripe fruit only, the corolla and styles having invariably fallen away. These latter, as well as the stamens, I have drawn and described from Mr. Gunn's specimens, fully believing the two plants to be the same. I must however here remark, that other states from either locality may be found to possess unexpected characters of sufficient importance to keep them distinct. I am not aware of any other species exhibiting 4 nucules.

The prevalence of *Rubiaceæ* in these islands is a very singular fact in botanical geography, ranking as they do in number of species next only to *Compositæ* among Dicotyledonous plants, and almost equalling

Fitch. del. et lith.

prel: lith: Linn: imp.

Coprosma repens. Hook. fil.

them both numerically and in the amount of space they occupy. In Antarctic America they are represented by a very few *Stellatæ*, which group is here entirely absent. As no other order exhibits so remarkable an excess, they probably balance the strangely disproportionate want of *Compositæ*, which appear to have almost as few representatives in proportion to the mass of exogenous vegetation as any other island. Comparing the dicotyledonous vegetation of the Falkland Islands with that of Lord Auckland's, it will be seen, that in the former the *Compositæ* are to the other Dicot. as 1 : 2·8, and that *Rubiaceæ* (*Galium*) are to *Compos.* as 1 : 21 : but in the latter group, *Compos.* are to the other Dicot. only as 1 : 4·5, and *Rubiaceæ* to *Compositæ* as 1 : 1·6 ! If in each we add these two Nat. Orders together, it will be found, that in the Falklands the proportion which the sum of *Rubiaceæ* and *Compositæ* bear to other Dicotyledonous plants, is as 1 : 2·7, and in Lord Auckland's group as 1 : 2·3 : proving, that as far as these two remote localities are comparable, *Rubiaceæ* only balance in the latter the want of what is generally, in all climates, the preponderating natural order. This is one only of many equally singular proofs, which a little patient investigation may deduce, that a harmony exists and may be traced in the vegetation of remote climates, whose Floras are otherwise totally dissimilar.

Plate XVI. *Fig.* 1, a ripe berry, *nat. size*; *fig.* 2, transverse section of do., showing the nucules; *fig.* 3, nucules removed; *fig.* 4, transverse section of the latter, showing the seed; *fig.* 5, lateral, and *fig.* 6, front view of a seed; *fig.* 7, vertical section of do. :—all *magnified.*

B. Flowering portion from Tasmanian specimens, *nat. size*; *fig.* 1, a male flower; *fig.* 2, a female flower :—both *magnified.*

1. Nertera *depressa*, Banks *in Gærtn.* i. t. 26. *et Icon. ined. Plant. Nov. Zel. in Mus. Brit.* t. 22. *Forst. Prodr.* n. 501. *Smith, Icon. ined.* t. 28. *Carmichael in Linn. Trans.* vol. xii. p. 505. *Gaudich. Flor. des Iles Malouines in Ann. Sc. Nat.* vol. v. p. 104. *Gaud. in Freycinet, Voy.* p. 135. *D'Urville, Flor. Ins. Mal. in Annal. Soc. Linn. Paris,* vol. iv. p. 612. *Pet. Thouars, Flor. Trist. d'Acun.* p. 42. t. 10. *DeC. Prodr.* vol. iv. p. 451. *A. Cunn. Flor. Nov. Zel.* l. c. p. 208.

Hab. Lord Auckland's group; creeping amongst moss in the woods, where its bright red berries give it a pretty appearance.

My specimens are unfortunately not in flower; they however entirely resemble the figures of *N. depressa* above quoted, and agree with numerous Falkland Island and other southern specimens of that plant with which I have compared it. In Mr. Cunningham's 'Flora of New Zealand,' its precise habitat is omitted; but it is inserted in a MS. copy of that 'Flora' which formed part of my library at sea. There he mentions the "Falls of the Keri-Keri river" as the only locality in which he gathered it. In botanizing over that spot repeatedly in September and October 1841, in company with Mr. Colenso, we often met with Cunningham's plant, both there and afterwards in other moist places near cataracts; it is however entirely different from the true *N. depressa*, being much smaller in all its parts, with narrower and more acuminated leaves. The berries of the Auckland Island specimens are very much vertically depressed, and their structure is entirely that of the genus *Coprosma.*

XV. COMPOSITÆ, *Vaill.*

Tribe SENECIONIDEÆ, *Less.*

1. TRINEURON, *Hook. fil.*

Capitulum sub-12-florum; floribus exterioribus 8–10, fœmineis, 2 serialibus; interioribus abortu masculis; omnibus ut videtur tubulosis. *Involucrum* octophyllum, subbiseriale, squamis inter se subæqualibus oblongo-lanceolatis obtusis trinerviis, nervis latiusculis pellucidis transversim septatis. *Receptaculum* nudum, minutum, convexiusculum. Fl. Fœm. *Corolla* tubulosa, basi globosa, medio cylindracea et constricta, ore obliquo 4-den-

tato, sub-bilabiato, dentibus obtusis, 1 reliquis sub-duplo longioribus. *Stylus* incrassatus, cylindraceus, exsertus, basi bulbosus, bifidus, ramis ovato-oblongis obtusis marginibus apiceque stigmatiferis. *Achænium* calvum, late obovatum, apice retusum, extus planiusculum, intus carinatum, carina marginibusque celluloso-incrassatis.—Fl. Masc. *Corolla* tubulosa, clavata, subtetragona, angulis incrassatis linea elevata cellulosis, 4-dentata, dentibus acutis erectis æqualibus. *Stamina* 4; filamentis ima basi corollæ insertis, angulis incrassatis alternantibus; antheris vix ac ne vix liberis, basi breviter productis. *Stylus* exsertus, basi (ut in fl. fœm.) bulboso-incrassatus, apice capitato truncato obscure bilobo. *Achænium* parvum, vacuum.—Herba *repens laxe cæspitosa, ramosa, glaberrima, ad terram montibus insularum Auckland et Campbell obvia.* Folia *alterna.* Capitula *inconspicua in ramis ultimis, primum inter folia sessilia, demum pedunculis propriis ultra folia productis apice foliiferis elevata.* Flores *fusco-purpurascentes.* Folia *spathulata v. lineari-spathulata elongata.*

1. Trineuron *spathulatum*, Hook. fil. (Tab. XVII.)

Hab. Lord Auckland's group and Campbell's Island; on peaty soil, near the summits of the mountains, alt. 1200–1400 feet.

Caulis breviusculus, 1–2 unc. longus, sublignosus, repens, fibras copiosas validas elongatas per totam longitudinem emittens, et reliquiis foliorum vetustorum undique tectus, superne parce ramosus; ramis brevibus ascendentibus erectisve foliosis ultra folia in pedunculum nudum apice floriferum productis. *Folia* basi imbricata, undique patentia, lineari-spathulata, glaberrima, integerrima, plus minusve elongata, ¼–1 unc. longa, obtusa, 3–5-nervia, plana, subcarnosa, læte viridia. *Capitula* parva, subsolitaria, vel 3–4 aggregata, juniora valde inconspicua, inter folia occulta, demum pedunculata; pedunculo ¼–1 unc. longo, apice folioso, foliis 2–3 reliquis longioribus. *Flores* minimi, vix ½ lin. longi, sub lente pulchre rubro-purpurei.

A very remarkable genus, most nearly allied to *Abrotanella*, Cass. (*Oligosporus emarginatus*, Gaud. in Ann. Sc. Nat. vol. v. p. 104. t. 3. fig. 4), but of a very different habit, and in many other particulars quite distinct, especially in the more numerous scales of the involucre, inserted in two series, in the many-flowered capitula, the quadrifid corollas of the ray, the curious tetragonous corollas of the disc, and the thickened cellular structure which exists in several parts of this plant. Besides the achænia having a thickened border and keel in front, formed of large lax transparent cells, the incrassated angles of the male flowers and the three nerves of the involucral leaves, exhibit the same singular character. In both the latter cases, the substance of the organs themselves, which are opake and fleshy, seems to be divided by broad lines of a transparent substance, marked with transverse septa.

Many of the discoid *Senecionideæ*, and especially in the tribe *Hippiæ* of Lessing, are remarkable for the curious and anomalous structure of their inflorescence. In several instances, as in the present, it may be doubted whether the flowers of the ray are really tubular, the general unequal division and oblique aperture of the mouth appearing to indicate their true structure as either ligulate or 2-lipped; 2-lipped perhaps in the present and the following genus, and assuredly 1-lipped or ligulate in *Abrotanella*, where I observe the three teeth all to point towards one side of the tube, with the middle one the longest. The teeth in this species have the margins thickened, and apparently revolute. The base of the style is peculiarly incrassated, especially in the female flower, having the base of the corolla swollen around it, and the thickened portion often forms a depressed sphere, in which the style seems to be inserted, and it sometimes assumes the appearance of a fleshy ring or corona, surmounting the top of the ovary.

The name is adopted in allusion to the three cellular nerves or lines of the ovary and involucral scales.

Plate XVII. *Fig.* 1, capitulum; *fig.* 2, scale of the involucrum; *fig.* 3, side view, and *fig.* 4, front view of flowers of the ray; *fig.* 5, back, and *fig.* 6, front view of ripe achænium; *fig.* 7, style of a flower of the ray, with its bulbous base; *fig.* 8, flower of the disc; *fig.* 9, stamen, and *fig.* 10, style from the same:—all *magnified.*

ASIATIC

Pitch del et lith.

prel: lith: Linn: imp.

Trineuron spathulatum. Hook. fil.

Fitch del et lith.

prel: lith: Linn: imp

Ceratella rosulata. Hook fil.

2. CERATELLA, *Hook. fil.*

Capitula aggregata, singulo 8–10-floro; floribus exterioribus sub 8, fœmineis, 1-serialibus; interioribus abortu masculis, omnibus, ut videtur, tubulosis. *Involucrum* 8–10-phyllum, squamis biserialibus coriaceis subacutis valde inæqualibus, interioribus linearibus 1–3-nerviis angustatis, exterioribus foliaceis latioribus plurinerviis, nervis omnibus cellulosis pellucidis transverse septatis. *Receptaculum* nudum, angustum, minutum, planiusculum vel subconicum, foveolatum. Fl. Fœm. *Corolla* tubulosa, elongata, basi globosa, ore profunde 4-dentato, dentibus majusculis subinæqualibus oblongis obtusis concavis medio macula oblonga pallida cellulosa pellucida deorsum in lineam extensa. *Stylus* validus, exsertus, basi bulbosus, apice breviter bifidus. *Achænium* compressum, tetragonum, anguste tetrapterum, alis membranaceis, oblongo-obovatum, 4-cornutum, cornubus brevibus divaricatis, 2 exterioribus sublongioribus. Fl. Masc. *Corolla* tubulosa, lineari-clavata, 3–4-dentata, sub 3–4-angulata, angulis pellucidis, dentibus concavis, dorso macula pellucida et linea extensa, ut in fl. fœm. *Antheræ* latiusculæ, inclusæ, basi breviter biaristatæ, apice apiculatæ, flavæ. *Stylus* validus, cylindraceus, corolla $\frac{1}{3}$ brevior, apice sensim latiore abrupte truncato margine crenato. *Achænium* obscure 4-gonum, parvum, vacuum omnino calvum.—Herba *pusilla, dense cæspitosa,* Androsacis *facie, rupibus præruptis ad cacumina montium insulæ Campbell proveniens.* Folia *alterna, densissime imbricata, stellatim patentia.* Capitula *aggregata, inter folia summa sessilia.* Flores *purpurascentes, parvi, inconspicui.*

1. Ceratella *rosulata,* Hook. fil. (Tab. XVIII.)

Hab. Campbell's Island; in crevices of rocks at the tops of the mountains, at an elevation of 1400 feet; very sparingly.

Caules dense pulvinati, ramosi, duri, rigidi, 1–1½ unc. longi, validi, inferne foliis vetustioribus dense obsiti, fusco-nigrescentes. *Folia* arcte imbricata, stellatim patentia, coriacea vel subcornea, superiora rosulata, basi latiore vaginante scariosa, medio contracta, deinde ovata, acuta, plus minusve concava, subtus striato-nervosa, marginibus acuentibus, superiora gradatim minora, 2–3 lin. longa, intense viridia, ætate fusco-tincta. *Capitula* in summos ramos 8–10, congesta, brevissime pedunculata, inconspicua, foliis subtensa, 2 lin. longa. *Involucri squamæ* irregulariter insertæ, ovato-oblongæ, subacutæ, concavæ, nervosæ, nervis (ut in *Trineuro*) celluloso-incrassatis transversim septatis pellucidis, interiores angustiores. *Flores* parvi, purpurei.

This plant is perhaps more closely allied to the last genus (*Trineuron*) than to any other, and exhibits many remarkable points of affinity with it, especially in the pellucid thickened parts of the flower and nerves of the involucral leaves; likewise the general structure of the capitula, corollas, stamens and styles is much alike in both. But while so many instances of resemblance exist, the totally different nature of the *achænium* becomes the more striking. In the tufted habit, harsh, coriaceous, even horny texture, the plant is more allied to *Abrotanella emarginata.*

These three genera form together a small group, allied in several respects to *Hippia,* Lessing, but naturally distinct, all the species of that division being herbaceous, more or less odorous, and often even furnished with pellucid glands.

The name is derived from the little horn-like processes of the achænium.

Plate XVIII. *Fig.* 1, a head of capitula; *fig.* 2, single capitulum, removed; *fig.* 3, receptacle and involucral scales; *fig.* 4, a flower of the ray; *fig.* 5, the same cut open; *fig.* 6, achænium; *fig.* 7, a 3-toothed flower of the disc; *fig.* 8, the same, with four teeth; *fig.* 9, the same cut open, and *fig.* 10, a stamen from do.:—all *magnified.*

3. LEPTINELLA, *Cass.*

Capitulum ∞ florum, heterogamum; floribus exterioribus fœmineis bi-triserialibus, disci abortu masculis tu-

bulosis. *Involucrum* hemisphæricum, 1–4-seriale, 8–20-phyllum, squamis oblongo-obovatis vel suborbiculatis adpressis. *Receptaculum* conicum, nudum, papillosum. Flor. Radii. *Corolla* compressa, tubulosa, basi latiore, ore obliquo 3–4-dentato, quasi e duplice membrana formata. *Stylus* exsertus, inclinatus, basi bulbosus, apice bifidus, ramis divaricatis oblongis versus apicem barbatis. *Achænium* calvum, valde obcompressum, elongato-obovatum, marginibus incrassatis. Flor. Disci. *Corolla* tubulosa, infundibuliformis, 5-dentata, dentium marginibus incrassatis. *Antheræ* ecaudatæ, cohærentes, exsertæ. *Stylus* exsertus, apice abrupte incrassato, cyathiformi, basi bulboso. *Achænium* parvum, vacuum.—Herbæ *antarcticæ et hemispharii australis incolæ, odore* Fœniculi *vel* Tanaceti, *plus minusve pilosæ seu lanatæ.* Caules *prostrati, radicantes, ramis brevissimis foliosis adscendentibus.* Folia *alterna, petiolata, basi scarioso-vaginantia, pinnatisecta.* Capitula *parva, solitaria, longe pedunculata, pedunculis terminalibus.* Flores *lutei.* *Cass. in DeC. Prodr.* (*paucis verbis mutatis*).

1. Leptinella *lanata,* Hook. fil.; caule prostrato, petiolis foliis superne pedunculisque lana longa densa molli albida vestitis, foliis petiolatis oblongis obtusis pinnatifidis segmentis acutis margine superiore pinnatifido-serratis basi vaginantibus, involucris carnosis floribusque totis glandulis obsitis, pedunculis foliis brevioribus in ramis brevibus terminalibus, involucris 3–4 serialibus glabris.

Hab. Lord Auckland's group; hanging abundantly over rocks and cliffs near the sea.

Caules herbacei, prostrati, decumbentes et adscendentes, vage ramosi, hic illic radices fibrosas emittentes; vetustiores nudi, pallide brunnei, remote cicatricosi; juniores foliosi, lanati, vaginis scariosis foliorum obsiti, $\frac{3}{4}$–2 ped. longi, pennæ gallinæ crassitie, lana copiosa laxa, gossypio simillima, e fibris intertextis tenuissimis simplicibus albidis formata. *Folia* petiolata, alterna, patentia, ovato-oblonga, obtusa, sub 1 unc. longa, flavo-viridia, plana, pinnatifida, supra juniora præsertim lanata, crassa, carnosa, segmentis ovatis obliquis 1–2 lin. longis, margine inferiore integra recta, superiore pinnatifido-serrata, segmentis acutis. *Petioli* folio æquilongi, lati, plani, basi vaginantes, scarioso-nervosi, nudi. *Pedunculi* e summis ramulis orti, solitarii, subunciales, recti, densissime lanati, foliis breviores. *Capitulum* diametro $\frac{1}{4}$ unc. *Involucrum* 4–5-seriale, squamis exterioribus valde carnosis, glandulosis, elliptico-rotundatis, viridibus, 1–$1\frac{1}{2}$ lin. longis, interioribus angustioribus, submembranaceis. *Receptaculum* nudum, conicum, latiusculum, papillosum, papillis elevatis ad apices foveolatis flores gerentibus. *Flores radii* fœminei, 3–4-seriales, densissime imbricati numerosi, glandulis conglobatis prominentibus obsiti. *Corolla* ovato-oblonga, compressa, e membrana duplici formata, 4-crenata, lobo unico longiore alio sæpe obliterato. *Stylus* breviter exsertus, basi bulbosus, quasi annulo carnoso epigyno valde depresso cinctus, apice breviter bifidus, ramis divaricatis obovato-oblongis obtusis extus dorso penicillatis. *Achænium* obovatum, compressum, margine subincrassato. *Flores disci* numerosi, abortu masculi, glandulosi ut in fl. radii. *Corolla* tubuloso-infundibuliformis, 4-dentata, dentium marginibus incrassatis. *Antheræ* cohærentes, inclusæ. *Stylus* validus, superne exsertus, inclinatus, apice cyathiformi. *Achænium* vix ullum abortivum.

This plant resembles, in some respects, the *L. scariosa,* Cass., but is very much larger, densely woolly in many parts, with its leaves shorter and less regularly divided; it also wants the pellucid glands which beset the leaves of that species and contain a powerful essential oil.

Plate XIX. *Fig.* 1, receptacle and involucrum; *fig.* 2, a flower of the ray; *fig.* 3, side view of the same; *fig.* 4, transverse section of the same; *fig.* 5, style from the same; *fig.* 6, bifid apex of do.; *fig.* 7, flower of the disc; *fig.* 8, style of the same; *fig.* 9, stamen; *fig.* 10, glands from the corolla:—all *magnified.*

2. Leptinella *plumosa,* Hook. fil.; tota pilis longis laxis molliter hirsuta, foliis longe petiolatis lineari-oblongis obtusis tripinnatifidis segmentis ultimis subulatis, pedunculis terminalibus lateralibusque solitariis elongatis gracilibus petiolo æquilongis, involucro 1-seriali floribusque eglandulosis, corollis fœmineis cordato-ovatis. (Tab. XX.)

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

Fitch. del et lith.

prel. lith. Vincent imp.

Leptinella lanata. Hook. fil.

ROYAL BOMBAY BRANCH OF THE ASIATIC SOCIETY

Fitch del et lith.

Leptinella plumosa Hook fil.

prel: lith: Lonn: imp:

HAB. Lord Auckland's group and Campbell's Island; amongst gravel and on grassy banks near the sea. McQuarrie's Island, (*Herb. Hook.*)

Caulis herbaceus, repens, breviusculus, crassitie pennæ anserinæ et ultra, parce ad apicem præcipue ramosus, ramis divaricatis brevibus foliosis 1-uncialibus nodosis, ad nodos fibras crassas descendentes emittens, hic illic molliter sericeo-pilosus. *Folia* longe petiolata, una- cum petiolo 3- unc. ad pedalem, flaccida, molliter pilosa, multisecta, quasi pulcherrime plumosa, lato-oblonga, pinnata; pinnæ alternæ, patentes, divaricatæ, subfalcatæ, $\frac{1}{4}$–1 unc. longæ, lineari-oblongæ, superiores utrinque bipinnatifidæ, inferiores margine posteriore integro, superiore solummodo pinnatifido, segmentis linearibus acuminatis margine exteriore præcipue profunde et acute inciso-serratis. *Petioli* folio æquilongi, graciles, antice plani vel concavi, marginibus submembranaceis, basi longe et latissime scarioso-membranacei, vaginantes, vaginis $\frac{1}{2}$ unc. longis integris striato-nervosis, ore nudo. *Pedunculi* gracillimi, axillares, in ramis brevissimis terminales, petiolo paulo longiores, plus minusve laxe albido sericei. *Capitula* solitaria, diametro circa $\frac{1}{4}$ unc., depresso-globosa. *Involucrum* cyathiforme; squamæ 1-seriales, æquales, basi subconnatæ, oblongæ, obtusæ, herbaceæ, floribus breviores, marginibus late scariosis denticulatis apice fusco-purpureis. *Receptaculum* nudum, elevatum, conicum, totum papillosum, papillis inferioribus gradatim longioribus, hinc flores radii manifeste stipitati. *Flores radii* fœminei, 2–3-seriales, numerosi, dense aggregati, imbricati, incurvati. *Corolla* structura insignis, cordato-ovata, compressa, dorso parum convexa, superne attenuata, ore obliquo 4-dentato, dentibus brevissimis obtusis unico longiore, e duplici membrana quasi formata, interiore cylindraceo gracili stylum amplectente et ejusdem formæ, apice ovarii inserta; inter has duas membranas vacua. *Stylus* validus, basi globoso-incrassatus, exsertus, cylindraceus, tubo interno corollæ arcte vaginatus, apice bifidus, ramis brevibus obtusis dorso ad apicem hirsutulis. *Achænium* corolla angustius, obovatum, obcompressum, crassum, calvum, marginibus incrassatis. *Semen* in loculo solutum. *Embryo* elongato-pyriformis. *Flores disci* abortu masculi, tubulosi. *Corolla* infundibuliformis, 5-dentatus, dentibus patentibus marginibus incrassatis. *Antheræ* $\frac{1}{2}$-exsertæ, cohærentes, ecaudatæ, filamentis linearibus ad medium tubi insertis. *Stylus* validus, crassiusculus, exsertus, paulo inclinatus, apice dilatato cyathiformi marginibus membranaceis integris, basi bulbosa, bulba oblongo-cylindracea. *Achænium* minutum, abortivum.

This is by far the most beautiful species of the genus, apparently common to the islands of the high Southern Indian and Pacific Oceans, but hitherto unknown among the Antarctic American groups. It was first detected on McQuarrie's Island, whence specimens were received by Mr. Frazer in New Holland, and by him transmitted to England; but it is not ascertained who found them, though it is more than probable they were gathered by some person accompanying a sealer. It is the only Composite plant as yet known to inhabit Kerguelen's Island, where it covers very large tracts of ground with its silvery and beautifully feathery foliage, smelling strongly, but not unpleasantly, of parsley. The female corollas of both species are represented as they being of my original sketches: when dried they seem much more compressed, their membranous texture appear in such extreme tenuity, that it is probable they never recover their original form after once being subjected to pressure.

PLATE XX. *Fig.* 1, receptacle and part of involucrum; *fig.* 2, scale of involucrum; *fig.* 3, flower of ray in natural state; *fig.* 4, anterior, and *fig.* 5, lateral view of the same from dried specimens; *fig.* 6, transverse, and *fig.* 7, longitudinal section of the same; *fig.* 8, apex of style from do.; *fig.* 9, achænium cut open; *fig.* 10, flower of disc; *fig.* 11, portion of corolla and stamen of do.; *fig.* 12, style of do.:—all *magnified.*

3. LEPTINELLA *propinqua*, Hook. fil.; tota pilis sericeis patentibus mollibus hirsuta, caule repente, foliis petiolatis glandulis impressis pellucidis punctatis oblongis obtusis basi attenuatis pinnatisectis segmentis obovatis inciso-pinnatifidis laciniis acutis, pedunculis folio brevioribus solitariis axillaribus sublanatis, involucri squamis 1–1$\frac{1}{2}$ serialibus oblongis obtusis extus hirsutis marginibus ad apices late scariosis denticulatis fusco-purpureis, floribus glandulosis, floris fœminei corollis ovatis achænio brevioribus, floris masculi corollis 4-fidis dentium marginibus incrassatis fuscis.

Hab. Lord Auckland's group; on banks near the sea.

In many respects this species is intermediate between the two former, but is equally distinct from both, and so nearly allied to the *L. scariosa*, as to induce me to adopt the name of *propinqua*; it differs from that plant in its much larger size, more divided leaves and very woolly habit. The genus *Leptinella* appears to have been hitherto but little understood by botanists; it was founded by Cassini in 1822, upon (apparently very imperfect) specimens of two plants whose habitat was entirely unknown. In 1841 it was again taken up by the authors of 'Contributions to a Flora of South America, &c.' (vide Hook. Journ. Bot. vol. iii. p. 325), where a supposed new species, *L. acænoides*, H. and Arn., is described. This latter is a very common plant in the extreme south of the American continent, and we have assumed it to be the *L. scariosa* of Cassini and DeCandolle, the leaves and peduncle being either smooth or hairy in that plant. There are still some characters described by the above-mentioned authors as belonging to that genus which my specimens do not exhibit. Thus all the flowers are stated in one species to be females: I do not find this to be the case; nor should much stress be laid upon a peculiarity of structure, drawn from a single capitulum "dont les fleurs sont extrèmement petites et défigurées ou altérées par la désiccation et la compression" (Cassini in Dict. Sc. Nat. vol. xxvi. p. 67). In all the plants of the genus which I have examined, the heads of flowers are monœcious; but the flowers of the disc especially, being all males, are, after the performance of their functions, easily displaced by pressure. The "long, straight, linear, obtuse, bracteiform leaf" (Dict. Sc. Nat. l. c.) at the base of the peduncle is also not apparent; nor am I able to conceive to what organ of our plant this can apply, except a young cauline leaf, generally present near the peduncle, can have assumed such a form or suffered mutilation. On the other hand, the description of the involucral scales, covered, as are the flowers, with glands, and the characters drawn from those organs themselves, will, collectively, accord with no other plants that have ever fallen under my notice. The second described species, *L. pinnata*, seems hardly to differ from the *L. scariosa*, except indeed that the notice of the above-mentioned glands is under it omitted; but Cassini further mentions the singular character of the female corolla being "enflée," an anomalous structure, upon which I shall here offer a few remarks.

In all the four species of the genus with which I am acquainted, the style of the flowers of the ray is invested, or sheathed loosely, by a very delicate hyaline tube, marked, in several instances, by distinct slender nerves, always five in number. This tube enlarges around the swollen bulb of the style and is inserted underneath it into the apex of the achænium: at its summit it meets the inflated corolla, and in the form of a membrane or tissue completely continuous with it, they together constitute the four obtuse, inconspicuous, rounded lobes of the corolla. The latter organ, thus viewed, consists of two distinct membranes, united above and perhaps below. On first observing this structure in *L. plumosa*, whose flowers are not furnished with glands, and whose corolla is, so far as I can detect, entirely nerveless, I was inclined to consider the corolla as reflected upon itself, the reflected portion entirely investing and concealing the real tube: because I was unable to trace any intervening tissue connecting the two parietes or opposite coats, where an apparent complete vacuity exists; and especially because in some allied genera of *Cotuleæ*, and in other plants not far removed from the present genus, the corolla is reflected, and in a Tasmanian species as much as half-way down its whole length, its lower free margin being obscurely four-lobed; and in *Otochlamys*, DeC., its base is produced downwards so as to hide a great portion of the achænium. On the other hand, in the three species which are supplied with glands, it is only the outer surface of the exterior coat of the *corolla* which is furnished with these organs. Were this outer membrane the reflected limb of the corolla, the true situation of the glands would be on its inner surface; but though appendages of the cuticle are not uncommon on the surface of both ligulate and tubular flowers of *Compositæ*, I am not aware of their ever existing on that surface. The oblique mouth of these corollas and the constantly unequal divisions at its apex, of which one is always the largest, seem to point out the larger tooth as being analogous to the ligula of radiate capitula, especially as one of the four teeth is often suppressed. Lastly, the five nerves, which are most evident in *L. lanata* on the inner tube, are not visible on the outer; it is very difficult to trace their termination, but they do unite at the summit of the tube, forming

as many arches as there are nerves, apparently without reference to the number of teeth of the corolla, in the thickened substance of which they are entirely lost. Amongst the discoid groups of *Senecionideæ*, there are many anomalous structures of the female corollas. Thus, in *Strongylosperma*, Less., the limb of that organ is reduced apparently to a very short tube, completely continuous with the achænium; and one of the principal characters of *Soliva*, R. and Pav., consists "in the want of corolla or" (as Mr. Brown remarks) "perhaps its accretion with the persistent style" (vide Linn. Trans. vol. xii. p. 101). The original species, *L. scariosa*, Cass., was transmitted alive to England from Cape Horn, and is now cultivated in the Royal Botanic Gardens at Kew, where it blossoms copiously, and as it increases rapidly and has been widely distributed, I hope that the attention of microscopic observers will be directed to the singular structure of its flowers. Though possessed of no beauty, it derives an interest from being one of the most Antarctic flowering plants.

The glands, so conspicuous in this and some of the other species, appear to be conglobate and formed of about four very prominent papillæ, confluent at their margins; in this species and in *L. scariosa* they are transparent, but in *L. lanata*, after drying, they turn opake and whitish. I observed that in the fresh state they contained no evident secretion or essential oil, nor can they be connected in any way with the peculiar odour which several of the species possess, as this is inodorous or nearly so, and *L. plumosa*, which smells strongly, is unprovided with these organs.

4. OZOTHAMNUS.

1. Ozothamnus (Petalolepis) *Vauvilliersii*, Hombr. et Jacq.; fruticosus, foliis patenti-recurvis oblongo-cuneatis supra canaliculatis glabris subtus ramulisque junioribus adpresse fulvo-tomentosis marginibus revolutis, corymbis terminalibus capitatis polycephalis ramosis, involucris turbinatis subcylindraceis squamis exterioribus araneo-tomentosis intimis radiatis scariosis albidis.—O. Vauvilliersii, *Hombron et Jacquinot in Voy. au Pol Sud, &c. Bot. Dicot. Phanerog.* pl. 5. *sine descript.*

Hab. Lord Auckland's Islands; from the sea to an altitude of 300–400 feet, very common. Also found on the high mountain of Tongariro, in the Northern Island of New Zealand, by Mr. Bidwill.

Frutex elegans, 6–8-pedalis. *Caulis* erectus, validus, 1–2-pedalis, e basi ramosus, cicatricibus dilatatis foliorum lapsorum notatus, cortice tenui griseo tectus; ligno albido tenaci. *Rami* fasciculati, stricti, erecti, virgati, 3–4 ped. longi, inferne cicatricosi, superne ad foliorum insertionem tuberculati, fusco-flavidi, hic illic pubescentes, cortice lamellato, ramulis subtomentosis. *Folia* undique inserta, subdecussata, patentia, recurva, brevissime petiolata, 4–6 lin. longa, elongato-cuneata, ad apices rotundata, coriacea, supra canaliculata, glaberrima, nitida, luride viridia, subtus nervo medio valido subcarinata, dense sed appresse fulvo-tomentosa, marginibus revolutis integerrimis. *Corymbi* terminales, capitati, compositi, pluries ramosi, polycephali, 1–1½ unc. lati, pedunculis pedicellisque brevibus divaricatis tomentosis. *Involucrum* sub 2–3 lin. longum, 3–4 seriale, squamis extimis brevibus subcoriaceis rubro tinctis, gradatim longioribus marginibus scariosis, intimis radiatis, ungue elongato erecto scarioso marginibus ciliato-serratis, lamina late ovata obtusa subpetaloidea albida margine undulata, omnia dorso plus minusve araneo-tomentosa. *Receptaculum* angustum, planum, papillosum, sub 10–12-florum. *Flores* involucro breviores, omnes tubulosi, hermaphroditi, tubo gracili elongato quinquefido, dentibus ovato-oblongis subacutis extus versus apices puberulis ciliatis. *Antheræ* elongatæ, inclusæ, stramineæ, basi biaristatæ, filamentis supra medium dilatatis. *Stylus* basi subincrassatus, ramis elongatis linearibus semiteretibus intus canaliculatis, apicibus truncatis penicillatis. *Pappus* 1-serialis, setis scabris inferne nudis imo basi subconnatis. *Achænium* obconicum, sulcatum.

5. HELICHRYSUM, *DeC.*

Subgen. CONODISCUS, *Hook. fil.* (*Capitulum homogamum, floribus omnibus hermaphroditis 5-dentatis. Involucri squamæ interiores 2–3-seriales, radiantes. Receptaculum valde conicum, elongatum, nudum, papillosum. Pappus uniserialis, setis scabris basi subconcretis.—Caules herbacei, prostrati, basi radicantes, divaricatim ramosi, ramis ad apices capitula solitaria gerentibus.*)—An genus proprium?

1. HELICHRYSUM *prostratum*, Hook. fil.; caule decumbente ramoso, foliis (omnibus caulinis) obovatis v. obovato-spathulatis obtusis mucronatis supra arachnoideis subtus ramulisque dense et appresse argenteo-lanatis, involucri squamis interioribus radiantibus albidis scariosis lineari-ligulatis ad apices 2–4-dentatis. (TAB. XXI.)

HAB. Lord Auckland's group and Campbell's Island; confined to rocks at the tops of the hills in the former locality; abundant in the more southern islands, trailing over rocks and banks near the sea. Also found on Mount Egmont, in the Northern Island of New Zealand, at an altitude of 4000 feet, by Dr. Dieffenbach.

This is a graceful and very elegant plant, in many places, and especially on the low grounds of Campbell's Island, covering the banks with its silvery foliage and abundance of flowers. It differs from all other species of the genus *Helichrysum*, DeC., in the prostrate straggling habit, and in the stems, which are scarcely thicker than a sparrow's quill, being leafy throughout their length, irregularly branched, with the branches divaricating, ascending at their apices, and there bearing the solitary capitula; whereas the Australian species particularly are of an erect growth, those of a more herbaceous habit with larger, as it were radical leaves at the base of the stem. It is however the conical and elongated receptacle that removes this species so far from the 212 described in DeCandolle; a character so evident, and of such importance, as almost to induce me to raise the present plant into a new genus. It is further to be remarked, that though the genus is extensively distributed throughout Australia and Tasmania, where it does not inhabit the mountains, in New Zealand it is represented by the present species alone, which is confined to the most elevated mountains of the Northern Island, and only descends to the lower grounds in a much higher southern and more rigorous latitude.

The leaves are rather scattered upon the stems, $\frac{1}{4}$–$\frac{1}{3}$ inch long, elliptical-obovate, produced into a short petiole, rather membranous in texture, silvery white from the dense appressed tomentum beneath, above pale green and opake, covered with scattered silky arachnoid hairs, the margins quite entire. The capitula are $\frac{1}{2}$–$\frac{3}{4}$ of an inch across the ray, pure white or faintly tinged with rose-colour, the outer scales shorter, subulate or lanceolate, cobweby with a loose tomentum. Flowers of the disc very small, almost concealed by the copious white or pale straw-coloured pappus. Tube of the corollas 4-cleft, the segments puberulous externally towards the apex. Anthers biaristate at the base.

PLATE XXI. *Fig.* 1, receptacle and scales of the involucre; *fig.* 2, inner radiating scales from involucre; *fig.* 3, a flower; *fig.* 4, seta of the pappus; *fig.* 5, flower with the pappus removed; *fig.* 6, anther; *fig.* 7, styles:—all *magnified*.

ASTEROIDEÆ, *Less.*

6. PLEUROPHYLLUM, *Hook. fil.*

Capitula multiflora, heterogama; floribus radii 1–3-serialibus ligulatis fœmineis, disci hermaphroditis tubulosis 4–5-dentatis. *Involucrum* depresso-hemisphæricum, sub 3-seriale, squamis imbricatis lineari-lanceolatis disco brevioribus. *Receptaculum* planum, nudum, alveolatum, dentatum. FLOR. RADII. *Corollæ* tubo terete

Fitch del et lith.

prel: lith: Linn: imp.

Helichrysum prostratum. Hook fil.

Pleurophyllum speciosum Hook. fil.

piloso, ligula brevissima v. elongata 3-dentata v. inæqualiter 2–3-fida v. tripartita, segmentis linearibus obtusis. *Stylus* teres, gracilis, exsertus, ramis sæpe inæqualibus linearibus elongatis compressis marginibus incrassatis glaberrimis. *Pappus* rigidus, pallide stramineus, (siccitate fuscus,) 2–3-serialis, multisetus, setis subæquilongis subpaleaceis scabris. *Achænium* obconico-cylindraceum, compressum, totum setosum, setis erectis appressis, breviter stipitatum, stipite tenui gracili alveolo immerso. Fl. Disci numerosi. *Corolla* infundibuliformis, tubo terete piloso, limbo 4–5-fido, segmentis elongato-ovatis obtusis revolutis marginibus incrassatis. *Antheræ* 5, cohærentes, inclusæ, basi obtuse et brevissime appendiculatæ. *Pollen* echinulatum. *Stylus* cylindraceus, ramis exsertis linearibus divergentibus, marginibus incrassatis, apicibus latiusculis conicis acutis extus (dorso convexo) marginibusque papillosis. *Pappus* ut in fl. radii. *Achænium* obconico-elongatum, subtetragonum, setosum et stipitatum ut in fl. radii.—Herbæ *elatæ, pulcherrime argenteo-sericeæ, fere ut in* Argyroxyphio, *hic illic lanatæ.* Folia *alterna, basi subvaginantia; radicalia maxima.* Flores *racemosi, purpurei.* Pappus *rigidus, copiosus, floribus disci longior.*—Nomen; πλευρὸν, *costa,* and φύλλον, *folium.*

§ 1. Radiatum; *radii corollis elongatis minute tridentatis.* (Pleurophyllum verum.)

1. Pleurophyllum *speciosum,* Hook. fil.; foliis villoso-lanatis, caule superne præcipue pedunculisque dense albo-tomentosis, capitulis radiatis radiis elongatis, receptaculo convexiusculo marginibus alveolarum crassis carnosis. (Tab. XXII. & XXIII.)

Hab. Lord Auckland's group and Campbell's Island; chiefly found upon wet banks and in marshes near the sea, but also ascending to the tops of the mountains in a stunted form.

Radix fusiformis, crassa, carnosa. *Caulis* elongatus, 2–3-pedalis, erectus, simplex, teres, v. obscure angulatus inferne crassus, carnosus, solidus, dense albo-tomentosus, tomento e pilis simplicibus inarticulatis inferne demum deciduo. *Folia* omnia coriacea et subcarnosa, multinervia, nervis parallelis, integerrimis, villosis, subsericeis, et pilis fuscis brevibus rigidis moniliformibus subscabrida: *radicalia* approximata, ovalia, apice obtusa, patentia, subpedalia, 6–8 uncias lata, fusco-viridia, basi villosissima, margine obtusa subrevoluta, subtus pallidiora; *superiora* seu caulina gradatim minora; *suprema* lanceolata obtusa. *Racemus* terminalis, elongatus, foliosus; folia (seu bracteæ) inferiora flores superantia. *Pedunculi* crassi, densissime albo-lanati, inferiores interdum compositi 3–4 flores; superiores simplices, patentes, sub-unciam longi. *Capitula* majuscula, sub 2 unc. lata, speciosa, pulcherrime purpurea, disco intensiore. *Involucrum* plano hemisphæricum, bi-triseriale; squamis lanceolatis obtusis imbricatis, exterioribus albo-lanatis, interioribus pilosis, 4–6 lin. longis discum subæquantibus. *Receptaculum* paululum convexum, epaleaceum, alveolatum, alveolarum marginibus (seu parietibus) crassiusculis undulatis. Flores Radii elongati, uniseriales, ligulati, circiter 15; ligula lineari, ½ unc. longa, patente, obscure 3-dentata; tubo brevissimo patentim piloso, pilis mollibus laxis pellucidis articulatis. *Stylus* cylindraceus bifidus, ramis lineari-oblongis obtusis purpureis planiusculis marginibus incrassatis. *Achænium* sub 2 lin. longum. Flores Disci circiter 60, intensius purpurei, tubulosi, infundibuliformes; tubo piloso, pilis ut in fl. rad., 5-fido et segmentis recurvis apicibus extus glabris. *Antheræ* flavæ. *Stylus* ramis exsertis.

An extremely handsome and showy species with copious large purple flowers, stems 2–3 feet high, and ample radical leaves, resembling those of *Plantago major,* L., but very much larger, strongly ribbed with prominent stout parallel nerves.

Plates XXII. & XXIII. *Fig.* 1, receptacle; *fig.* 2, setæ of the pappus; *fig.* 3, a flower of the ray; *fig.* 4, tube and style of do., showing the hairs on the tube of the former; *fig.* 5, front view, and *fig.* 6, lateral view of the achænium of a flower of the ray; *fig.* 7, a flower of the disc; *fig.* 8, corolla from the same; *fig.* 9, a stamen from do.; *fig.* 10, styles from the same:—all *magnified.*

§ 2. DISCOIDEUM; *radii corollis abbreviatis, bifidis trifidis v. tripartitis.* (Pachythrix, *Hook. fil.*)

2. PLEUROPHYLLUM *criniferum*, Hook. fil.; caule toto dense albo-lanato, capitulis globosis, subdiscoideis ligulis brevissimis, receptaculo planiusculo alveolato, alveolarum marginibus submembranaceis dentatis. (TAB. XXIV. & XXV.)

HAB. Lord Auckland's group and Campbell's Island; generally in marshy places from the sea to an elevation of 1000 feet, abundant. M^c^Quarrie's Island. (*Herb. Hook.*)

Radix crassa, carnosa, subfusiformis, descendens, nigro-fusca, collo fibris crassis elongatis rigidis crispato-tortuosis fuscis sublignosis (reliquiis foliorum) coronata. *Caulis* elatus, erectus, crassus, simplex, v. rarius inferne parce ramosus, 4–6-pedalis, basi unciam diametro, carnosus. *Folia* inferiora approximata, multinervia, plicata, subtus præcipue valde sericea, basi longe sericeo-villosa, nervis crassis subtus prominentibus fuscis; marginibus minute spinuloso-serratis: *radicalia* maxima, concava, ovalia, obtusa, sæpe bipedalia, pedem fere lata, basi attenuata amplexicaulia; *superiora* sensim minora, angustiora, apice acuminata, basi magis attenuata: *suprema* fere subulata, in bracteis transeuntia. *Capitula* in racemum spithameum et ultra disposita, nutantia, majuscula, subglobosa, unciam lata, pedicellata, pedicellis subuncialibus curvatis teretibus rachique dense sericeo-lanatis. *Involucri* squamæ lanceolatæ v. subulatæ longissime subaristato-acuminatæ, crassæ et coriaceæ, dorso pilosæ, medio uninerves, marginibus scariosis argute ciliato-serratis, apicibus fuscis. *Pappus* rigidus, subpaleaceus v. nitidus, recens flavidus, siccitate fuscus apicibus opacis. FL. RADII sub 3-seriales, ligulati, tubo brevi terete curvato piloso pilis patentibus mollibus laxis moniliformibus; ligula late ovata, brevissima, tubo subæquilonga, 4-nervis, 3-dentata, v. inæqualiter 2–3-fida, v. tripartita, segmentis linearibus obtusis, marginibus incrassatis, luride purpurascens.

A very common and striking plant, often covering a great extent of ground, and forming the larger proportion of the food of the hogs which now run wild upon the islands of Lord Auckland's group. It is indeed so abundant in the marshy spots on the latter islands that these animals frequently live entirely amongst it, especially when it grows near the margins of the woods, where they form broad tracks or runs through the patches, grubbing up the roots to a great extent, and by trampling down the soft stems and leaves use them as soft and warm forms to litter in. The leaves are exceedingly handsome, generally two feet long and one or a little more in breadth, from their concavity holding a considerable quantity of the rain-water or melted snow which so frequently falls in those latitudes; in substance they are coriaceous, but not nearly so much so as in the preceding species, and they are more copiously silky. A full-grown leaf is generally traversed by 30–40 parallel strong nerves, very prominent on the under surface and then dark-coloured and nearly glabrous, depressed on the upper with longer silky hairs. The intervening parenchymatous substance is traversed by numerous slender anastomosing veins, beneath densely clothed with a white appressed cottony wool, and above silky with scattered subarachnoid hairs. The hairs and woolly substance which clothe all the stems, leaves and pedicels of the capitula are formed of simple terete transparent matted filaments. I do not find amongst them any of the short rigid beaded setæ which are intermixed with the softer hairs of the *P. speciosum*. The capitula are 15–20 in number; the lower ones only bracteate with the uppermost leaves, the terminal generally having a smaller elongate subulate nearly glabrous green bract. The intermediate ones are the most densely silky on both sides, often so much so as entirely to hide the nerves; in these, too, the curious but minutely spinuloso-serrate character of the margin is most easily detected; the apices of the serratures are callous and glabrous, almost entirely hid amongst the silky tomentum.

Though this plant is nearly allied to the former species (*P. speciosum*), and agrees with it in all the most important characters, they materially differ in the more outward points of resemblance. Indeed I only know one genus to which the present plant bears any marked similarity in general habit and appearance, and that is the *Argyroxyphium*, DeC. (Prodr. vol. v. p. 668; Hook. Ic. Plant. vol. i. p. 75). The mode of growth of these

Pleurophyllum criniferum. Hook. fil.

two plants is the same, and both are natives of Pacific Islands, abounding in peculiarly inclement localities; the present being an inhabitant of the Antarctic regions, while the *Argyroxyphium* is found only on the summits of the highest mountains on the Sandwich Islands. Mr. Douglas brought it from the volcano of Mouna Kaah, which reaches an altitude of 18,400 feet, where it was one of the last plants he met with, and he used its dead stems for fuel. In the clothing and substance (as far as can be judged from dry specimens) of the stem, in the disposition of the inflorescence and form of the involucral scales, and in the short ligulæ of the flowers of the ray, these plants entirely accord: and the lower leaves of the latter, though uniform in size and shape with the upper, and having the margins quite entire, are always clothed with a similar but more beautiful and dense silky coat of hairs. On a further examination of the form of the corollas and achænia the analogy ceases. It must not however be overlooked, that the pappus of *Pleurophyllum*, though composed of setæ (and not of short paleæ), is of a peculiarly harsh and rigid texture, with each seta flattened and scabrid on the opposite margins, quite unlike the soft character that organ assumes in most *Compositæ*, both showing its affinity to other *Asteroideæ*, and some approach to the short rigid paleæ of the Sandwich Island plant. Although the *Argyroxyphium* is placed by DeCandolle in *Senecionideæ*, its styles appear to me to differ in no important particular from those of the *Pleurophyllum* and of other large Asteroid genera. In both these, the styles of the flowers of the ray are always longer than those of the disc, with the arms also longer, linear, obtuse and flattened, erect or diverging in most of the tribe, divaricated and inclined to become revolute in *Argyroxyphium*; they are invariably quite smooth throughout, and surrounded with a thickened darker-coloured border (the stigmatic series), those of the corresponding side of each arm meeting at the base. In the flowers of the disc they are shorter, equally bordered with a thick conspicuous margin, abruptly ceasing at the commencement of a conical, acute, rather broader apex, which is plane and smooth, or most indistinctly glandular, on the inner surface, but with the margins and convex back densely studded with elongated papillæ or glands (the pollen collectors); these papillæ, except under a very high power, appear as hairs: the arms have further a strong opake central nerve in each, meeting and uniting at the base. In *Argyroxyphium* the conical apices are very short and studded with long papillæ, whence they appear abrupt, and each of the arms is split into two parallel laminæ, between which a knife is easily inserted, when the midrib is seen remaining on the inner of the two lamellæ, and the stigmatic series on the outer. I do not think that in a natural system the two genera now under consideration should be far separated from one another, or from the following genus *Celmisia*, Cass.

Though generally so very bulky a plant, that an ordinary specimen of the *Pl. criniferum* weighs many pounds, I have seen it so dwarfish upon the mountains as barely to exceed a span in height, with all the leaves lanceolate, more densely silky, and thus even more nearly resembling *Argyroxyphium* than it does in its ordinary state. The masses of curly fibres, which may be taken up in handfulls from the summit of the roots of a common-sized plant, form a very remarkable character.

PLATES XXIV. & XXV. *Fig.* 1, receptacle and portion of involucre with flower of ray and disc *in situ*; *fig.* 2, single scale of the involucre; *fig.* 3, alveolæ of the receptacle; *fig.* 4, setæ of the pappus; *fig.* 5, a corolla with the ligula 3-partite; *fig.* 6, a flower of the ray with the ligula 3-toothed; *fig.* 7, style from the same; *fig.* 8, front, and *fig.* 9, lateral view of the achænium; *fig.* 10, flower of the disc; *fig.* 11, corolla of do.; *fig.* 12, stamen, and *fig.* 13, style from do.:—all *magnified*.

7. CELMISIA, *Cass.*

Capitulum multiflorum, heterogamum; *floribus radii* 1-serialibus, ligulatis, fœmineis; *disci* numerosis, tubulosis, hermaphroditis, 5-dentatis. *Involucrum* campanulatum, v. depresso-hemisphæricum, pluriseriale, squamis elongatis inæqualibus disco paulo longioribus v. subæquilongis. *Receptaculum* nudum aut alveolatum, epaleaceum, latiusculum, plus minusve convexum. FLOR. RADII. *Corolla* tubo elongato terete glaberrimo v. piloso pilis articulatis; ligula lineari, patente, interdum revoluta, apice subintegra v. 3-dentata, albida, sæpius roseo suffusa. *Stylus* teres, gracilis, exsertus, ramis linearibus plus minusve elongatis obtusis v. subacutis, marginibus valde

incrassatis lævibus glaberrimis. *Pappus* rigidus, multisetosus, sub-biserialis, rufus, v. pallide stramineus, setis subpaleaceis inæqualibus scabris v. barbellatis. *Achænium* elongato-obconicum v. oblongo-cylindraceum, basi attenuatum, estipitatum, nudum, pilosum, v. setis appressis hispidum. FLOR. DISCI. *Corolla* tubulosa, plus minusve elongata et infundibuliformis, tubo terete glabro v. piloso ut in fl. radii, limbo 5-fido, segmentis patenti-revolutis obtusis, marginibus incrassatis, apicibus extus glabris v. barbatis. *Antheræ* cohærentes, basi integerrimæ, ecaudatæ, rarius breviter biaristatæ, v. in appendices abbreviatas productæ. *Pollen* globosum, echinulatum, luteum. *Stylus* teres, elongatus, ramis brevioribus quam in floribus radii, primum linearibus marginibus incrassatis glaberrimis, deinde sublatioribus in conum brevem v. elongatum intus planum nudum dorso convexo marginibusque papillosis productis, papillis interdum elongatis. *Pappus* tubo subæquilongus et *achænium* ut in floribus radii.—Herbæ *speciosæ Australasicæ, et insularum Tasmaniæ, Novæ Zelandiæ et Antarcticarum incolæ, albido-lanatæ seu sericeæ, rarius glaberrimæ.* Folia *pleraque radicalia, lanceolata v. linearia, rarius oblonga.* Caules *seu* Scapi *erecti, foliosi, apice capitulum solitarium gerentes.*

Subgen. IONOPSIS, *Hook. fil.* (non H.B.K. nec DeCand.) *Involucri squamæ lineares obtusæ. Receptaculum convexum, subhemisphæricum. Flores disci intense purpurei.—Herba tota glaberrima, nitens, quasi vernicosa seu polita.*

1. CELMISIA *vernicosa*, Hook. fil.; acaulis, subsurculosa, foliis radicalibus numerosissimis stellatim-patentibus linearibus acutis mucronatis coriaceis remote subserratis rigidis glaberrimis vernicosis marginibus revolutis, costa subtus latissima, scapo foliaceo vaginato, capituli disco purpureo, styli florum disci ramis acutis. (TAB. XXVI. & XXVII.)

HAB. Lord Auckland's group; on banks and rocky places near the tops of the hills, alt. 1200 feet, and near the sea on the exposed islets. Campbell's Island; abundant in the immediate neighbourhood of the sea.

Radix subfusiformis, elongata, obliqua, hic illic fibrosa, superne punctis elevatis copiosis cicatricata; collo rigide setoso e reliquiis foliorum emortuorum, et non raro surculoso; surculis (an scapis abortivis?) ramos simulantibus simplicibus 2 uncias ad spithamæum longis fibrosis foliis superioribus majoribus. *Folia* radicalia, numerosissima, læte viridia, imbricata, plerumque horizontaliter et stellatim patentia, unciam ad 3–4 uncias longa, 1–3 lineas lata, linearia, seu lineari-subulata, coriacea, rigida, mucronato-acuta, integerrima v. remote et obscure serrata, glaberrima, nitida, quasi vernicosa, margine revoluta, basi dilatata membranacea, superne ad costam linea depressa, subtus costa latissima prominente. *Scapi* radicales, 1–10–13, adscendentes, demum erecti, spithamæi fere ad pedalem, foliosi, foliis (v. bracteis foliaceis) approximatis lineari-lanceolatis acutis basi vaginantibus subsucculentis apicibus rigidis vernicosis. *Capitulum* solitarium, erectum, majusculum, unciam ad sesqui-unciam latum, radiatum, roseo-album, disco intense purpureo. *Involucrum* plano-hemisphæricum, e squamis s. foliolis biserialibus linearibus obtusiusculis coriaceo-membranaceis rigidis nitidis linea dorsali notatis, marginibus subciliatis viridibus apice purpureis, 4–5 lineas longis. *Flores radii* sub-20, fœminei; ligula lineari-oblonga, 4-nervis, revoluta, apice obscure 2–3-dentata, tubo brevi hirsuto, pilis articulatis. *Styli rami* lineares, breviusculi, obtusi, albidi, eglandulosi. *Achænium* (vix maturum) obconicum, sericeo-setosum. *Pappus* e setis rigidis subpaleaceis pilosis uniserialibus. *Flores disci* numerosi, compacti, hermaphroditi. *Achænium* et *pappus* ut in floribus radii. *Corolla* tubulosa, infundibuliformis, superne ventricosa, teres, 5-fida, segmentis apice reflexis, tubo hirto, pilis ut in floribus radii. *Antheræ* 5, in tubum connatæ, lineari-oblongæ, flavæ, basi breviter bisetosæ, inclusæ. *Styli rami* exserti, breviusculi, purpurei, dilatati, compressi, plano-convexi, acuti, ad apicem dorso marginibusque glanduloso-stigmatosi, intus nudi. *Receptaculum* parvum, nudum, convexum, depresso-punctatum, epaleaceum.

This is a very handsome plant, to which even the beautiful drawing now prepared for publication hardly does justice, one of the specimens gathered on Campbell's Island measuring nearly a span across the leaves.

Celmisia vernicosa. Hook. fil.

from whose bases arose no fewer than thirteen flowering scapes, ten of them with the blossoms fully expanded. The delicacy of the rays, tipped with a faint rose-colour, forms a striking contrast with the dark purple eye and the glossy varnished deep green foliage. Like many other Antarctic plants, it varies considerably in size, some of our specimens being scarcely an inch and a half across the leaves, which lie densely compacted and all horizontally patent, radiating from the summit of the root like the spokes of a wheel, of a very coriaceous texture, singularly smooth and shining like the surface of a shell, or as if covered with a thick coat of copal varnish: their apices in the smaller specimens are incrassated or the leaves are clubbed at the apex, from the union of the thick costa with the equally incrassated margins. This thickening extends to the bracteæ or leaves on the scapes and even to the scales of the involucre; when dry they are of a rich but pale yellow-brown colour.

The genus *Celmisia*, as modified above, will contain several species very closely allied in habit, and all bearing a much greater similarity to the original Australian *C. longifolia*, A. C., than the *C. vernicosa* does. Upon the closest examination, I can detect no characters of sufficient importance to warrant any further subdivision of the following species, which I shall therefore include under the name of *Eucelmisia*, considering them as typical of the genus, near to which the above-described species should assuredly rank.

I shall here, in a note, subjoin the characters of the other species, and proceed with some remarks upon them*.

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* Synopsis of the species of *Celmisia* known to the Author.

CELMISIA, *Cass.*

§ I. EUCELMISIA.

1. *Species Australasicæ.*

1. C. *longifolia*, Cass.; foliis linearibus utrinque argenteo-lanatis scapo lanuginoso subæquilongis, pappo rufo, achæniis glaberrimis, stylorum apicibus breviusculis obtusis.

α. foliis explanatis, scapo folioso.—HAB. Jamieson's Valley, Port Jackson; *Gaudichaud.*

β. foliorum marginibus revolutis, scapo nudiusculo.—HAB. Blue Mountains; *Cunningham.*

2. C. *spathulata*, A. C.; "foliis elliptico-oblongis in petiolum longe attenuatis utrinque glabris."—DeC.

HAB. Oyster Harbour, King George's Sound; *A. Cunningham.*

3. C. *asteliæfolia*, MSS.; foliis elliptico- v. lineari-lanceolatis, supra argenteo-lanatis subtus dense sericeo-tomentosis marginibus revolutis, scapis folio subduplo longioribus parce foliosis, achæniis pilosis, antheris basi breviter biaristatis, stylorum apicibus ut in *C. longifolia.*

HAB. Mount Wellington and other lofty mountains of Tasmania; *Frazer* and *Gunn.*

2. *Species Novæ Zelandiæ.*

4. C. *gracilenta*, Hook. fil. Aster gracilentus, *Banks and Sol. MSS.*; foliis scapisque ut in *C. asteliæfolia*, achæniis glaberrimis, styli ramis longe productis gradatim acuminatis, papillis filiformibus elongatis.

HAB. New Zealand, Northern Island; *Banks* and *Solander.* Great Barrière Island on the East coast; *Dr. Sinclair.* Lofty mountains of Waikato Lake; *Colenso, Bidwill.* Mount Egmont; *Dr. Dieffenbach.*

5. C. *graminifolia*, Hook. fil.; foliis lanceolatis v. lineari-lanceolatis subflaccidis, supra glaberrimis, subtus appresse argenteo-lanatis, acuminatis, scapis 2–3 foliis brevioribus, stylis ut in *C. gracilenta.*

HAB. Bay of Islands, New Zealand.

6. C. *spectabilis*, Hook. fil.; foliis oblongo-lanceolatis integerrimis valde coriaceis basi vaginantibus longis-

C. longifolia (1.). This is the original species, whereon the genus was founded by Cassini; the specimens having been brought home by Gaudichaud from the voyage of Admiral Freycinet, and described in 'Dict. Sc. Nat.' vol. xxxvii. p. 259. DeCandolle considers Cunningham's Blue Mountain species (*Arctotis gnaphalodes*, Cunn. MS. in Herb. Hook.) as identical with this. Our specimens differ from Gaudichaud's figure only by having the leaves much narrower, with their margins revolute and the scapes far less leafy upwards. The achænia are constantly glabrous, the pappus pale reddish, and the papillose part of the arms of the style is as long as the linear and glabrous portion. Of the *C. spathulata* (2.), A. C. MSS., we have no specimens; in its glabrous foliage it differs from all but *C. vernicosa*. A third species is founded on a Tasmanian plant not rare on the summit of Mount Wellington, where it forms large matted patches. The first specimens I had seen were gathered there by Mr. Frazer, and more latterly by myself and Mr. Gunn, who detected it in other mountainous parts of the colony. I have called it *C. asteliæfolia* (3.), from the great similarity it bears in foliage, general aspect and habitat to *Astelia alpina*, Br. The leaves are extremely variable in breadth and in the degree of recurving in their margins; they are often very like those of *C. longifolia*, but never exceed a span in length. The scapes too are longer, less leafy, and the flowers larger than in that species; the hairy achænia also afford a constant character. The flowers of the ray are pink, the pappus yellow. The above three species are Australian. Those found in New Zealand are *C. gracilenta* (4.), a plant so very near, even in the variable form of its leaves, to *C. longifolia*, that it was not till I had examined the styles that I could detect any difference; the conical papillose portion of these being much produced, gradually acuminated, and three times the length of the lower part of the arms, with the papillæ almost filiform. From *C. asteliæfolia* it differs in having a glabrous achænium, which is much longer than in any of the former species. Nearly allied to this is the *C. graminifolia* (5.), mainly distinguished from the former by its foliage. Decidedly the finest species are the three following, two of them originally discovered and described by Forster; the first is *C. spectabilis* (6.), of which I possess a specimen from Mr. Bidwill. Though hardly exceeding a span in length, including the scape, the base of the stem, while covered with the sheathing leaves, is fully an inch in diameter, and densely clothed with long, beautifully silky wool. The leaves are broad and remarkably coriaceous, their upper surface, in the dried state, minutely striated with anastomosing lines, and the under densely clothed with buff-coloured appressed tomentum. The scape is stout, loosely covered with shaggy white wool, and producing a large, solitary, apparently white flower, an inch and a half broad. The achænia are elongated, all of them glabrous; the tubes of the corolla, especially of the ray, have long, straight, pellucid, scattered, distantly jointed, and very slender hairs. Pappus yellow, rigid; the outer setæ, as in the other species of the genus, short, the rest gradually lengthening. Ligules of the flowers of the ray linear, abruptly truncated, with three large teeth and four nerves. Anthers shortly biaristate at the base; styles with the arms rather elongated, the conical papillose portion of those of the disc short and rather obtuse. Forster's first species, *C. holosericea* (*Aster*, Forst.), has been found, I believe, by that botanist alone: his specimens exist in the British Museum, accompanied by his fine drawing of

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sime sericeo-lanatis supra glabris subtus tomento fulvo appresso densissime obtectis, achæniis glaberrimis, tubo corollæ piloso, antheris breviter biaristatis.

Hab. Northern Island; Tongariro; *Mr. Bidwill.*

7. C. *holosericea*, Hook. fil. (*Aster holosericeus*, Forst. Prodr. n. 296); "herbaceus, foliis oblongo-lanceolatis serratis, subtus argenteo-sericeis, scapis unifloris foliosis."—*Forst. l. c.*

Hab. Dusky Bay; *G. Forster.*

8. C. *coriacea*, Hook. fil. (*Aster coriaceus*, Forst. Prodr. n. 297); foliis oblongo-lanceolatis valde coriaceis supra medio sulcatis glabris subtus villosis, achæniis pilosis, pappo rufo.

Hab. Dusky Bay; *G. Forster.*

both the present and the last species. Richard (Flora Novæ Zelandiæ, p. 249) described it from other and less perfect individuals, aided by Forster's MS. in the Museum of the Jardin des Plantes at Paris. He however does not notice its affinity to *Celmisia*, and considers the *C. coriacea* as probably a variety of it, though Forster's figures essentially differ in general appearance, and other characters are found in the parts of the inflorescence of no less importance, the achænia described by Richard being "silky and stipitate" (attenuated?) at the base. Mr. Cunningham, in his 'Prodr. Flor. Nov. Zeland.,' first noticed the probable relation existing between these last two species and *Celmisia* (Cass.). The scales of the involucre in all the New Zealand species, except *C. vernicosa*, are narrow and almost subulate, becoming recurved and finally squarrose in the older capitula; this is, however, a variable character.

I may here mention another little-known New Zealand plant, originally discovered by Forster, and called by him *Arnica oporina* (Forst. Prodr. n. 299); it is nearly allied both to these and the former genus *Pleurophyllum*. I have carefully examined specimens from Dusky Bay, gathered by Mr. Menzies, and others from Chatham Island, received from Dr. Dieffenbach. The achænia are ribbed and hairy, the pappus rigid, rather scanty, pale-coloured, scabrous, and of very unequal setæ. The tubes of the corollas in the ray are glabrous, in those of the disc slightly hairy. In both flowers the arms of the style precisely resemble those of *Celmisia* and are very long, those of the disc with short papillose extremities. A comparison of this plant with the genus *Chiliotrichum* of Cassini, (published in DeCandolle's Prodromus, vol. vi. p. 216, and Hooker's Icones Plantarum, vol. v. t. 485) does not enable me to detect any generic distinction: the arms of the style in the flowers of the ray are indeed rather longer in the latter and slightly attenuated upwards, and the achænia are glandular and not hairy. Both approach very closely the genus *Eurybia*, Cass., or *Olearia*, Mœnch.

Plate XXVI. & XXVII. *Fig.* 1, involucre cut open, showing the hemispherical receptacle with a flower of the disc and of the ray; *fig.* 2, a flower of the ray; *fig.* 3, setæ of the pappus; *fig.* 4, tube of the ligulate flower; *fig.* 5, style from do.; *fig.* 6, flower of the disc; *fig.* 7, corolla from do.; *fig.* 8, anther from the same; *fig.* 9, styles from the same:—all *magnified.*

Dubii generis.

Amongst the plants collected in Lord Auckland's group, are two apparently belonging to the natural order *Compositæ*, but which, in the absence of flower or fruit, I am unable to place under any genus. One of these may belong to *Gnaphalium*, but is quite different from any New Zealand or other species which has come under my notice. The only specimen of it which I possess was gathered by Mr. Lyall, and consists of apparently a few radical leaves, or probably of a young plant whose stems are not yet produced upwards.

1. Gnaphalium? radice lignoso, caule breviusculo 2–3 unc. longo adscendente e basi ramoso folioso, foliis confertis patulis obovato-lanceolatis subspathulatis obtusis integerrimis planis medio obscure uninerviis utrinque lana laxa molli albida vestitis $\frac{3}{4}$–1 unc. longis 4–5 lin. latis.

Hab. Lord Auckland's group; on the sea-beach, *D. Lyall, Esq.*

The woolly substance which entirely clothes the leaves and stem of this plant is formed of simple, terete, transparent, matted filaments, similar to that of *Gnaphalium luteo-album*, L., to some states of which this bears a good deal of resemblance. It may with equal probability be referred to a species of *Helichrysum*, and except that the apices of the leaves are not apiculate or mucronate, it has much the appearance of young plants of *H. apiculatum*, Lab.

The other plant, if I am right in referring it, as I do with little hesitation, to *Compositæ*, forms one of the most handsome shrubs or low trees belonging to that natural order. It was also detected by Mr. Lyall, from whose specimens I shall here give a short description:—

Subarborea, ramis ultimis lignosis teretibus striatis v. canaliculatis validis, $\frac{1}{2}$ unc. diametro,

cortice tenaci e fibris crassis parallelis tomento denso albido adpresso vestito, foliis alternis petiolatis amplis 8 pollicares ad pedalem longis late elliptico-ovatis acutis v. acuminatis crenato-dentatis valde coriaceis supra (costa basi excepta) glaberrimis læte viridibus nervis reticulatis subtus tomento appresso dense lanatis, venis prominulis, junioribus ad apices ramulorum convolutis lanatis basique dense argenteo-sericeis pilis longioribus, petiolo valido $\frac{1}{2}$ unc. longo basi dilatato semiamplexicauli tomentoso $\frac{1}{2}$ unc. longo.—Cætera ignota.

HAB. Lord Auckland's group; Ewing Island, a small islet at the mouth of Rendezvous Harbour, *D. Lyall, Esq.*

Of this plant Mr. Lyall remarks, "A short stout trunk rises a few inches above the ground, and then sends off horizontally patent branches, which radiate as from a common centre for 10 or 12 feet on all sides, a little above the surface of the earth. The leafy apices then ascend. The leaves are of a dark green colour, which they lose in drying." A piece of the wood which accompanied the specimen is about $1\frac{1}{2}$ inch in diameter; the bark of a light grey colour, rather thin and soft, deeply grooved on the surface, the grooves corresponding to sinuous, anastomosing, longitudinal ridges, enclosing elongated, somewhat lozenge-shaped spaces; the wood is whitish or pale yellow, hard, tough and close-grained, the layers indistinct, and the medullary rays numerous and very slender; it resembles the stem of some shrubby species of *Ozothamnus*. This fine plant is most remarkable for the size and thick coriaceous texture of the leaves, which are in many respects similar to those of the genus *Brachyglottis*, Forst. I have seen nothing like it in the collections of Banks and Solander, Forster or Menzies. It is a rare plant in the islands now under consideration, and will probably be found to be a native of the southern extremity of New Zealand.

XVI. STYLIDIEÆ, *Br.*

1. FORSTERA, *L.*

Flores monoici v. dioici. *Calyx* basi bibracteolatus, limbo 3–6-partito, segmentis erectis. *Corolla* tubuloso-campanulata, tubo brevi v. elongato, limbo 4–9-partito, segmentis inæqualibus, æstivatione imbricatis, 1–2 ext. majoribus, patulis concavis, fauce nuda v. glanduloso-incrassata. *Glandulæ epigynæ* 2, oppositæ, semilunares, staminibus alternæ. *Antheræ* ad apicem columnæ oppositæ, divaricatæ, reniformes, spurie biloculares, rima transversali dehiscentes, valvula superiore majore fornicata. *Pollen* 3–5-angulatum. *Stylus* intra columnam occlusus. *Stigma* (v. apex styli) minimum, 2-lobum (an 4-lobum ?), ramis floribus fertilibus porrectis, superne villosis v. subplumosis. *Ovarium* obovatum, carnosum, uniloculare, rarius biloculare, multiovulatum, *ovulis* columnæ centrali funiculis brevibus adnexis, ascendentibus. *Capsula* ovalis, uniloculāris.—Herbæ *parvæ, perennes, glabræ, coriaceo-carnosæ, antarcticæ seu montibus altissimis Novæ Zelandiæ provenientes.* Folia *imbricata.* Flores *in summos ramos sessiles, v. pedunculos elongatos solitarii v. bini.*—Endl.

§ HELOPHYLLUM, Hook. fil.; *floribus sessilibus solitariis, calycis limbo 5–6-partito, lobis æqualibus, foliorum apicibus nodoso-incrassatis.*

1. FORSTERA *clavigera*, Hook. fil.; densissime et compacte cæspitosa, caulibus erectis parce ramosis, foliis arcte imbricatis semiteretibus apicibus nodoso-incrassatis, floribus terminalibus sessilibus solitariis. (TAB. XXVIII.)

HAB. Lord Auckland's group and Campbell's Island; on the mountains in turfy and boggy places, very common.

Caules erecti, stricti, parce ramosi, densissime compacti, cæspites firmos fragiles formantes, per totam longitudinem foliosi, hinc illinc axillis foliorum radices fibrosas emittentes, fibris validis elongatis fuscis horizontaliter patentibus carnosis simpliciusculis, et deorsum in radices subsimiles gradatim attenuatæ, $1\frac{1}{2}$–2 polli-

ROYAL ASIATIC SOCIETY OF THE BOMBAY BRANCH OF THE

Forstera clavigera.

Fitch del. et lith.

prel: lith: Lith: Imp.

cares, una cum foliis diametro ¼ pollicis. *Folia* undique inserta, creberrime imbricata, numerosissima, stricta, erecto-patentia, linearia, obtusa, glaberrima, basi dilatata subvaginantia, marginibus tenuiter membranacea, medio subcontracta, dorso teretia, antice anguste plana vel canaliculata, ad apices globoso-incrassata, coriacea, crassa, dura, viridia, nitida, 2½–3 lin. longa; adulta inferne turgida, subampullacea, fusco-brunnea, suberosa, laxius imbricata. *Flores* ad apices ramulorum omnino sessiles, inter folia occlusi, limbo corollæ solummodo exserto, verosimiliter monoici, v. potius hermaphroditi. *Calycis tubus* brevis, turbinatus, v. floribus masculis obconicus, basi bibracteolatus; limbus 5–6-partitus, lobis linearibus obtusis erectis carnosis semiteretibus medio uninerviis, dorso infra apices pilosis, tubo corollæ æquilongis; bracteolæ oppositæ, segmentis calycinis simillimæ, basi remotæ. *Corolla* campanulata, albida; tubus latus, brevis, teres; limbus sub-bilabiatus, nempe inæqualiter 5–9-partitus, segmento unico v. duobus cæteris majoribus, rarius 4-partitus, segmento unico maximo 2-nervi, omnibus obovatis obtusis concavis planis v. ad faucem biglandulosis sinubusque incrassatis. *Glandulæ epigynæ* 2, oppositæ, semilunares, columnæ basin fere cingentes, crassæ et carnosæ, virides, antheris alternæ. *Columna* valida, erecta, ante anthesin protrusa, recta v. paululum inclinata, teres, superne incrassata. *Antheræ* 2, ad apicem columnæ sessiles, transversæ, majusculæ, reniformes, v. potius hypocrepiformes, divaricatæ, 1-loculares, connectivo carnoso in loculum porrecto costam elevatam formante, hinc spurie biloculares, linea curvata homotropa horizontaliter dehiscentes, valvis subcarnosis cellulosis purpureis inæqualibus, superiore majore fornicato suberecto post anthesin revoluto, inferiore horizontaliter porrecto marginibus lateralibus revolutis. *Pollen* opacum, 3–4-angulatum, flavo-viride, minutissime granulatum, angulis globoso-incrassatis, margine hyalino cinctum. *Stylus* floribus abortivis intra antheras occlusus, parvus, angustus, inconspicuus, convexus, v. brevissime bilobus; floribus fertilibus bilobus, lobis porrectis divaricatis antheris alternis uncinatis carnosis sursum glanduloso-plumosis. *Ovarium* flore masculo angulatum, pedicellum breve crassum simulans; flore fertili late obovatum, v. turbinatum, teres, carnosum, 1- rarius 2-loculare, ∞ ovulatum; ovulis parvis ascendentibus. *Capsula* immatura coriaceo-carnosa, 1-locularis. *Semina* semi-matura 6–8, obovata, ascendentia; testa membranacea, pallide brunnea; albumine carnoso. *Embryo* non visa.

Though abundant upon the hills of Lord Auckland and Campbell's Islands, this plant has not hitherto been brought from any part of New Zealand, neither from the mountains of the Northern Island, whence Mr. Bidwill and Mr. Colenso have sent home several of the more common Antarctic species, nor in the southern parts of that group, so well explored by Forster and Menzies. In general habit and appearance it bears a greater similarity to the *Phyllachne uliginosa*, Forst., than to its New Zealand congener, *Forstera sedoides*, L., although in the more essential characters it is much more nearly allied to the latter, the leaves being entire, the calycine segments equal and regular, and the epigynous glands much developed. In other respects, and especially in the mode of growth and form of the leaves, the present plant is so dissimilar from either, that I have ventured to place it under a separate sectional name, adopted in allusion to the incrassated apices of the leaves.

There are several points in the structure of the three plants above alluded to which seem to require some consideration; and having the opportunity of examining the flowers of all the species, I shall here offer a few remarks upon them, premising that, except in the case of *F. clavigera*, the specimens at my disposal were too few to allow of the full verification of the observations.

Linnæus first supposed *Phyllachne* to be monœcious (Suppl. Plant. p. 62), and Swartz (Schrader, Journ. fur Botanik, vol. i. p. 273, translated in Kœnig's Annals, vol. i. p. 286) follows Forster (Charact. Gen. t. 58) in supposing both this and *F. sedifolia* to be dicœcious. If, as I suspect, the only truly fertile flowers of *F. clavigera* are such as bear the uncinate plumose styles, that plant is certainly monœcious. Out of very many flowers examined, I only found such stigmata in two, both of which had abortive anthers, and they were moreover furnished with the only capsules in which I saw the immature seeds brown, and apparently fertile. Though there is a marked difference in the development of the apex of the style in the abortive flowers of this plant, it never, that I have seen, approaches the form it bears in the fertile flowers; at all other times it is exceedingly minute and probably variable in the lobes. Of the *P. uliginosa* I examined six flowers, only one of which

contained perfect stigmata; in it the style branched into two capitate arms, pubescent externally, and in all respects analogous to the stigmata of the former plant; the ovary was however in so very young a state, that I could not detect any concomitant character in the ovules; the anthers were decidedly abortive. In *F. sedifolia*, L., I have seen no other stigmata than two small uncinate fleshy bodies, concealed between the two upper valves of the anthers, parallel with them, and alternating with two small glands? at the back of these organs. In form and situation they answer to the plumose stigmas of the two former, but they are smooth throughout. In another flower I find the apex of the style to be depressed and to appear minutely 4-lobed, with the lobes unequal and rounded: in both these cases the anthers were full of pollen, and the ovules in a rudimentary state. In Swartz's description of this plant he notices a crest of projecting hairs, arising from a fleshy septum, obscurely lobed under the microscope, which connects the two anthers and separates the two lobes of the true apex of the style or stigmas. Swartz distinctly alludes to the two small glands or stigmata as being protected by the upper valves of the anthers, and they are hence probably analogous to two of the four lobes into which, in the flower I examined, the apex of the style appeared to be divided. Swartz's supposition, that the septum and crista of fine hairs form a connectivum between the anthers, separating the stigmata, appears to me to indicate a most anomalous condition of those parts; and as it is, from its position and structure, analogous to the arms of the style and stigmata in the two former species, I conclude that that author examined fertile flowers of *F. sedifolia*. It is still more remarkable that so acute and very accurate an observer should have been unable to detect the glands at the base of the column, which in both my specimens are exceedingly large, and project upwards like two horns from the top of the ovarium for half the length and upwards of the tube of the corolla, and whose apices in the young state of the flower lie between the anthers. It is possible that they may be obscurely developed in fertile flowers of this species, which however is not the case in those of *F. clavigera* or of *Phyllachne uliginosa*.

In *F. clavigera* there are apparently two very different states of the corolla: in many of my specimens of this plant that organ is divided into 5–7 lobes, all of them concave and even, of the same thickness throughout; more rarely they are 4 or 9; but in other corollas taken from the same specimens the divisions are undulated, with the borders of the sinuses much thickened, and each of them furnished at the throat with two linear, elevated, divaricating ridges or glands, which branch off from the middle nerve in the upper part of the tube, and are abruptly clavate at the extremity, near the margin of the segment, with whose thickened margins they sometimes unite. In some respects they resemble the nectaries of *Ranunculus pinguis* (Tab. I.), being only occasionally present; they however contain no secretion. Though I could trace no connection between this, the common form of the corolla, and the fertile or abortive state of the ovarium, I may remark, that where the segments are smooth and even, the apex of the style is hardly prominent or visible between the anthers, and also that in the most divided corollas the segments were most undulated and thickened; in *F. sedifolia* they are also very distinct, though nowhere described that I am aware of; and they are also evident, but not so fully developed, in the few flowers of *Phyllachne* which I have examined. I have also described the corolla as somewhat two-lipped, a character not very evident in all instances, and depending upon the inequality and comparative size of the segments; one or two are almost invariably larger than the rest, and external in æstivation; when there are two large lobes they are placed near one another; and when the corolla has more than five segments, these two are subdivided into four by short sinuses; where only four segments exist, it is caused by the union of two of the small lobes.

All the species have the anthers spuriously 2-celled, by means of a thick fleshy ridge which runs at the base of the anther, between the valves, and projects half-way across the cavity. After the dehiscence of these organs, they together form a cross placed horizontally on the top of the column, from their unsymmetrical contraction; of these, the lower one on each side projects horizontally and forms a right angle with the axis of the column, its two lower lobes approximating below; the upper becomes erect, and its upper margin being revolute, meets that of the opposite anther; this appearance is represented at fig. 10. The ovary, which is generally

Pratia arenosa. Hook. fil.

Fitch del. et lith.

prel. lith. Linn. imp.

1-celled, I have rarely found divided into two cells by a more or less thickened septum. Two bundles of vessels, one from each of the arms of the style, meet in the column and traverse its length; at the summit of the ovarium they sometimes again divide, and as separate cords enter its cavity, meeting again in the central column which bears the placentæ.

The last circumstance to which I shall here allude concerns the inflorescence of these species of *Stylidieæ*. In one of Mr. Bidwill's specimens of *F. sedifolia* from the mountain of Tongariro, in the Northern Island of New Zealand, the peduncle is 2-flowered, and the position of the bracts on the pedicels, and at the base of the ovaria, shows their true situation and the nature of the inflorescence to be the same in *Forstera* as in many *Stylidia*. This two-flowered specimen has six bracts, two of which are placed at the forking of the peduncle, one situated upon and belonging to each of the pedicels; but the other four form two pairs, each pair placed immediately at the base of the ovarium. In the solitary and sessile-flowered species it is sometimes difficult to distinguish the bracts from the upper leaves; in *F. clavigera* however they are sufficiently distinct, but never more than two, nor in *P. uliginosa* are there probably more, though they gradually pass into the ordinary forms of the leaf. In the latter plant some foliaceous expansions, which are generally considered as segments of the calyx, are often placed upon the germen; I have not remarked how they are disposed upon distinctly fertile ovaria of this species; where however that organ is imperfectly developed, it may be readily understood how a little irregularity in the insertion either of the calycine lobes or bracts might lead to the one being mistaken for the other.

PLATE XXVIII. *Fig.* 1, branch of *F. clavigera* with an expanded plicate corolla, and the arms of the style developed; *figs.* 2 and 3, cauline leaves from the same; *fig.* 4, flower with the segments of the corolla even and plane; *fig.* 5, a portion of a corolla from *fig.* 1; *fig.* 6, ovarium and epigynous glands; *fig.* 7, column with perfect anthers; *fig.* 8, longitudinal section of the same; *fig.* 9, pollen from the same; *fig.* 10, anthers after the pollen has escaped; *fig.* 11, column with stigmata and imperfect anthers; *fig.* 12, transverse section of 1-celled ovarium; *fig.* 13, longitudinal section of 2-celled do.; *fig.* 14, immature seeds:—all *magnified.*

XVII. LOBELIACEÆ, *Juss.*

1. PRATIA, *Gaud.*

Calycis tubus ovatus v. obovatus, rarius obconicus, lobis 5 ovatis acutis superioribus paulo longioribus. *Corolla* subcampanulata, longitudinaliter fissa, unilabiata, lobis subæqualibus elongato-ovatis. *Antheræ* 2, inferiores apice setis paucis terminatæ. *Stigma* bilobum, lobis extus puberulis. *Fructus* indehiscens, baccatus, bilocularis, carnosus, v. membranaceus, polyspermus.—Herbæ *parvæ, glabræ, repentes, Australes et Antarcticæ, succo aqueo; ramis radicantibus divaricatim ramosis.* Folia *alterna.* Pedunculi *solitarii, nudi, v. bracteolati.*

1. PRATIA *arenaria,* Hook. fil.; glaberrima, subcarnosa, foliis breviter petiolatis ovato- v. obovato-rotundatis undulatis marginibus obtuse sinuato-dentatis, floribus immaturis in axillis foliorum sessilibus, fructibus brevissime pedunculatis globosis purpureis. (TAB. XXIX.)

HAB. Lord Auckland's group; creeping over the open sandy shores of Enderby's Islet, Rendezvous Harbour: *Lieut. H. Oakeley.*

Caules elongati, 4–7 uncias longi, crassi, carnosi, diametro pennæ gallinæ, teretes, divaricatim ramosi, ramis paucis patentibus repentibus ad axillas foliorum inferiorum fibras crassas emittentibus. *Folia* remota, subsemiunciam longa, distantia, horizontaliter patentia, v. ascendentia, circumscriptione plus minusve rotundata, plerumque concava, undulata, carnosa, in petiolum latum brevem 2 lin. longum contracta, $\frac{3}{4}$ unc. lata, paulo

longiora, marginibus sinuato-undulatis, vel subdentatis, nervis tenuibus reticulatis, in axillis gemmas floresve gerentia. *Flores* valde immaturi tantum mihi visi, parvi, brevissime pedunculati; pedunculi basi v. supra basin bibracteolati, bracteolis parvis lanceolatis acutis. *Calycis tubus* oblongus; limbus inæqualiter 5-lobus, tubo brevior, lobis ovato-subulatis acutis, superiore majore basi utrinque et duobus proximis basi extus auriculatis, 2 inferioribus minoribus. *Corolla* profunde 5-loba, lobis æstivatione valvatis virido-purpureis. *Stamina* lobis corollæ alterna, filamentis crassis, antheris cohærentibus, 2 superioribus ad apicem 3–4 setosis, seta intermedia longiore. *Ovarium* biloculare, loculis multiovulatis; ovulis anatropis, funiculis brevibus. *Stylus* apice bifidus, lobis brevibus extus puberulis v. pilosis. *Bacca* subglobosa, obscure bisulcata, v. biloba, lobo superiore majore basi gibboso, segmentis calycinis coronata, sub 4 lin. longa, bilocularis, parietibus carnosis rubro-purpureis venosis, dissepimento carnoso ad medium incrassato placentifero. *Semina* numerosissima, funiculis brevibus dissepimento adnata, ascendentia, parva, ovalia, testa crustacea atra nitida, nunc brunnea, seu castanea, albumine carnoso. *Embryo* minimus, orthotropus, pyriformis, radicula tereti crassa obtusa hilo proxima, cotyledonibus brevibus.

A very distinct species, of which I much regret that I have not more satisfactory specimens which would allow of an examination of the expanded flowers. The peduncles of the bud and of the berry are so remarkably short, as at once to point out this as very distinct from any others of the genus; and it further differs from all the other round-leaved species in the size and obscure toothing of the leaves, their very short petioles, and in the red-purple colour of the berries. It is most nearly allied to the *P. angulata* (vide infra).

Having had the opportunity of examining some species of *Pratia* in Herb. Hooker, I shall here append the characters of all that are known to me as certainly belonging to this genus*; besides which, there are several

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* PRATIA, *Gaud.*

§ I. *Lobis calycinis* 3 *v. pluribus basi auriculatis.*

1. P. *arenaria*, Hook. fil.; vide supra.

Hab. Auckland Islands.

2. P. *Cunninghamii*; ramis ascendentibus, foliis subdistichis sessilibus ovato-lanceolatis v. oblongo-ovatis obtusis obtuse repando-serratis coriaceo-carnosis, pedunculis folio $\frac{1}{2}$–$\frac{1}{4}$ brevioribus, bacca ovato-globosa submembranacea, seminibus testa coriacea pallide brunnea areolata v. granulata.—Isolobus? Cunninghamii, *Alph. DeC. in Prodr.* vol. vii. p. 354. Lobelia inundata, *Cunn. MSS.* (*non Br.*) *an* Lob. concolor, *Brown, Prodr.* p. 563? Pratia erecta, *Gaud. in Freycin. Voy. Bot.* p. 456?

Var. β. *longipes*; pedunculis folio æquilongis longioribusve.

Hab. New Holland; morasses on the banks of the McQuarrie River: *Frazer*. Low lands about the Hunter River; *A. Cunningham*.

β. Inundated banks of the Lachlan River; *A. Cunningham*.

§ II. *Lobis calycinis basi nudis, seu auriculis nullis.*

3. P. *repens*, Gaud.; ramis repentibus radicantibus, foliis erectis longe petiolatis carnosis subcordato-orbiculatis sinuato-dentatis, pedunculis crassis petiolo æquilongis bi- tri-bracteolatis, bacca globosa carnosa, seminibus pallide fuscis.—P. repens, *Gaud. in Ann. Sc. Nat.* vol. v. p. 103. *Voy. Freyc.* pp. 134 and 456. t. 79. *D'Urv. Fl. Ins. Mal. in Mém. Linn. Soc. Paris*, vol. iv. p. 608. *Alph. DeC. in Prodr.* vol. vii. p. 340.

Hab. Falkland Islands, Tierra del Fuego, and S. Chili, on the east and west side of the Andes.

I have not retained the var. *Urvilleana*, Alph. DeC. l. c., because in my specimens the calycine segments are

other New Zealand and New Holland solitary-flowered creeping *Lobeliaceæ* with unilabiate corollas, but in the absence of any specimens with fruit I am unwilling to add them here.

The genus *Pratia* was established by M. Gaudichaud on a species detected by himself in the Falkland Islands, the *P. repens*, which was first described in Ann. Sc. Nat. vol. v. p. 103 (*anno* 1825); but the original discoverers of the genus were Banks and Solander, who, during Captain Cook's first voyage, gathered the *P. angulata* in New Zealand (in 1769): to the species of M. Gaudichaud there was first added another from La Plata by M. Chamisso (Linnæa, vol. viii. p. 212), and more lately what appears to me a truly distinct species was published as a variety of this last, under the name of *P. hederacea*, β. *elliptica* (vide Hook. Bot. Journ. vol. i. p. 278). I have seen the fruit of all these except the *P. hederacea*, and they agree with the characters of *Pratia*. In 1839 M. Alph. DeCandolle removed the *Pratia begonifolia*, Wall., and erected it into a separate genus, *Piddingtonia*, mainly on account of the 2-lipped corolla; besides this character of the corolla, which has the two outer lobes

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very variable in length, as is the corolla itself and the tube of the calyx in shape, the form of the latter depending upon the greater or less maturity of the seeds.

4. P. *hederacea*, Cham.; ramis repentibus, foliis petiolatis membranaceis late ovatis rotundatisve crenato-dentatis basi subcordatis, petiolis limbo longioribus, pedicellis folio longioribus, corolla filamentisque intus basi villosis.—*Chamisso in Linnæa*, vol. viii. p. 212. *Alph. DeC. in Prodr.* vol. vii. p. 340.

Hab. South Brazil and Uraguay; *Chamisso, Gaudichaud.*

Having only seen a solitary but authentically-named specimen of this (communicated from Herb. reg. Berol.), I have no opportunity of dissecting the flowers: in the villous tube of the corolla it differs from all the other species I am acquainted with.

5. P. *elliptica*; caule repente, ramis erectis prostratisve, foliis distichis brevissime petiolatis oblongis obtusis remote repando-dentatis dentibus obtusis, pedunculis folio longioribus fructiferis valde elongatis, capsula membranacea elongato-pyriformi, seminibus parvis, testa lævi pallide brunnea.—P. hederacea, β. elliptica, *Alph. DeC. in Prodr.* vol. vii. p. 340. Lob. hederacea, β. elliptica, *Hook. & Arn. Bot. Journ.* vol. i. p. 277. L. odorata, β. *Graham in Edinb. New Phil. Journ. for* 1831.

Hab. Buenos Ayres and mouth of La Plata River, in marshy places; *Tweedie.*

The authors of 'Contributions to a Flora of South America' remark, that the fruit does not seem to differ from that of a true *Lobelia*; but the only seed-vessel I have examined seems truly indehiscent, and the corolla is most distinctly unilabiate. It is very different from the true *P. hederacea*, a plant those authors were not then acquainted with, and in many respects, especially in the distichous leaves, it resembles the *P. Cunninghamii.*

6. P. *angulata*; ramis prostratis elongatis basi radicantibus apicibus adscendentibus, foliis petiolatis ovato-oblongis v. ovato-rotundatis obtusis repando-dentatis, pedunculis gracilibus folio multoties longioribus, seminibus testa pallide brunnea minute punctata.—Lobelia angulata, *Forst. Prodr.* n. 309. *A. Richard, Flor. Nov. Zel.* p. 227. *A. Cunn. Prodr. Flor. Nov. Zel. in Ann. Nat. Hist.* vol. ii. p. 50. L. littoralis, *R. Cunn. in A. Cunn. Prodr. Flor. Nov. Zel.* l. c.

Hab. New Zealand; Northern and Middle Islands in moist places.

This is a very variable plant in the size of the leaves, corolla and berries.

7. P.? *Boliviensis*, Alph. DeC. in Prodr. vol. vii. p. 340.

Hab. Bolivia.

Of this species I know nothing.

removed by a deeper division from the rest, the calycine segments are more membranous and foliaceous, and the whole plant more or less hairy; its berry is very similar to that of *P. arenaria*, being large and apparently purple. Unless in specimens furnished with tolerably ripe fruit, it is difficult to recognise the genus *Pratia*, the character of the corolla being common to other true *Lobeliaceæ*, as is also that of the calyx, except that some of the species possess additional small lobes at the base of one or more of the segments. The bracts on the peduncles are also only occasionally present, and their situation is very variable.

PLATE XXIX. *Fig.* 1, a young flower on a branch, of the natural size; *fig.* 2, the same removed; *fig.* 3, an anther aristate at its summit; *fig.* 4, young stigmata; *fig.* 5, ripe berry; *fig.* 6, transverse, and *fig.* 7, longitudinal section of the same; *fig.* 8, ripe seed; *fig.* 9, the same cut open, showing the embryo; *fig.* 10, embryo removed:—all *magnified*.

XVIII. EPACRIDEÆ, *Br.*

Tribe STYPHELIEÆ, *Br.*

1. ANDROSTOMA, *Hook. fil.*

Calyx 5-phyllus, basi bibracteolatus (pedunculis multi-bracteolatis). *Corolla* urceolata, limbo imberbi, segmentis 5 acutis. *Stamina* fauce corollæ sinubus inserta, filamentis breviusculis antherisque omnino exsertis. *Discus* hypogynus cyathiformis, profunde 5-lobus. *Ovarium* 2–4-loculare, loculis monospermis. *Drupa* baccata putamine osseo.—Fruticulus *ex Insulis Auckland et montibus Novæ Zelandiæ, prostratus, ramosus, ramorum apicibus ascendentibus*. Folia *parva, sparsa, linearia, patentia, integra, subtus striata*. Flores *parvi, inconspicui*.

1. ANDROSTOMA *empetrifolia*, Hook. fil. (TAB. XXX.)

HAB. Lord Auckland's group; in the upland regions, abundant.

Caules prostrati, graciles, filiformes, elongati, spithamæi ad bipedalem et ultra, diametro pennæ corvinæ, basi nudiusculi, fusco-brunnei, cicatricosi, ramosi, ramis elongatis, apicibus ascendentibus foliosis. *Folia* parva, 1½ lin. longa, undique inserta, nullibi conferta, inferioribus sparsis, horizontaliter patentia, breviter petiolata, linearia, subacuta, marginibus recurvis; supra convexa, medio canaliculata, fusco-viridia; subtus glauca, striata, pubescentia, demum glabra, rigida et coriacea; juniora imbricata, erecta; seniora caduca. *Flores* rari, sparsi, axillares, valde inconspicui, solitarii v. bini, pedunculati. *Pedunculus* ½ lin. longus, 1- rarius 2-florus, arcuatus, villosus, multi-squamosus, squamis 10–12 parvis imbricatis ovatis obtusis pergamentaceis medio incrassatis, marginibus subscariosis ciliatis, dorso sericeo-pubescentibus. *Calyx* 5-phyllus, basi bibracteolatus, tubo corollæ æquilongus, foliolis erectis late ovatis subacutis 3–5-nerviis ciliatis dorso pubescentibus; bracteæ 2, oppositæ, forma et textura inter foliola calycina et squamas pedunculi, sed manifeste calyci propriæ. *Corolla* tubuloso-urceolata, minima, inconspicua, sub ½ lin. longa, ad medium 5-fida, segmentis suberectis ovato-lanceolatis acutis medio uninerviis nervisque duobus lateralibus inconspicuis, marginibus recurvis sub lente minutissime scabridis, æstivatione imbricatis. *Stamina* 5, tota exserta, filamentis lineari-subulatis fauce ipsa intra sinus corollæ insertis, erectis, segmento ½ brevioribus superne curvatis, antheris apice filamenti pendulis late oblongis. *Discus hypogynus* carnosulus, cyathiformis, profunde quinquelobus, lobis rotundatis integris. *Ovarium* ovatum, sessile, basi disco hypogyno cinctum, gradatim in stylo valido attenuatum, 2–4-loculare, loculis uniovulatis, ovulo funiculo brevi angulo superiore interno loculi pendulo, elongato. *Drupa* immatura, carnosa, late ovata, 1 lin. lata, corolla ventricosa calyceque persistente suffulta et semi-immersa stylo acuminata; putamine indurato 2–4-loculari.

As this plant has been found by Mr. Bidwill on Tongariro, it is probably not uncommon in the alpine

OF THE BOMBAY BRANCH OF THE ASIATIC SOCIETY

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fitch. del. et lith.

prel. lith Linn. imp.

Androstoma empetrifolia Hook. fil

regions of New Zealand, especially as it is particularly abundant in Lord Auckland's group, where it creeps over the ground and forms low wiry bushes, resembling the Crow-berry (*Empetrum nigrum*); the flowers are very inconspicuous, smaller than those of any other plant of the Nat. Ord. with which I am acquainted. The ripe fruit I have never seen; Mr. Bidwill describes the plant as bearing a white berry. The name, from ἀνὴρ (*stamen*) and στόμα (*os, oris*), is adopted in allusion to the position of the stamens, wherein the chief distinction lies between this genus and *Lissanthe*, Br.

PLATE XXX. *Fig.* 1, flower and peduncle; *fig.* 2, a scale from the peduncle; *fig.* 3, a calycine leaflet; *fig.* 4, corolla; *fig.* 5, the same expanded; *fig.* 6, the same cut open, showing the insertion and position of the stamens; *fig.* 7, front, and *fig.* 8, back view of a stamen; *fig.* 9, ovarium; *fig.* 10, unripe berry; *fig.* 11, transverse section of do.; *fig.* 12, unripe seed:—all *magnified.*

Tribe EPACREÆ, *Br.*

2. DRACOPHYLLUM, *Lab.*

Calyx 5-phyllus, basi bracteatus, bracteis persistentibus vel caducis. *Corolla* tubuloso-infundibuliformis, limbo 5-partito, lobis patentibus v. suberectis æstivatione imbricatis, apicibus inflexis cucullatisve imberbibus, tubo tereti subventricoso vel campanulato, fauce plus minusve contracta. *Stamina* 5 inclusa, corollæ adnata, v. rarius hypogyna. *Squamæ hypogynæ* 5. *Capsula* 5-locularis, loculicide 5-valvis, placentis ab apice columnæ centralis pendulis solutis. *Semina* pendula, angulata, testa reticulata.—Frutices *vel* arbores *Australasicæ et Novæ Zelandiæ, unico Novæ Caledoniæ, paucis ex insulis Antarcticis pervenientibus; ramis denudatis annulatis cicatricosis.* Folia *imbricata, basi vaginantia, graminea v. subulata.* Flores *racemosi, seu spicati, pedunculis lateralibus terminalibusve.* Bracteæ *a lobis calycinis plerumque vix distinguendæ.*—Character e Candollei Prodromo ad species omnes mihi cognitas includendas mutuatus.

1. DRACOPHYLLUM *longifolium*, Br.; arboreum, ramis atris exustis, ramulis castaneis, foliis ad apices ramulorum confertis e basi lata vaginante abrupte angustioribus longissime lineari-subulatis strictis rarius (plantis junioribus) recurvis concavis striatis pubescentibus vel glabris; floribus spicatis, spicis solitariis rarius binis aggregatisve lateralibus 7–9-floris, pedicellis articulatis, bracteis deciduis, corollæ tubo campanulato calycem superante, limbi segmentis late ovatis obtusis. (TAB. XXXI. & XXXII.)—*Brown, Prodr.* p. 556 (in nota). *A. Rich. Fl. Nov. Zel.* p. 219. *A. Cunn. Prodr. Flor. Nov. Zel. in Ann. Nat. Hist.* vol. ii. p. 48. *DeC. Prodr.* vol. vii. p. 770. Epacris longifolia, *Forst. Prodr.* n. 68. *Char. Gen.* t. 10. n. 1. *et MSS. in Mus. Par. a Cl. A. Richard, l. supra cit. evulgata.*

HAB. Lord Auckland's group and Campbell's Island; in woods near the sea, abundant, never ascending more than 400 feet on the hills.

Caulis seu *truncus* arboreus, ascendens, 15–25 ped. altitudine, diametro 1½ pedalis, et paulo ultra prope basin, ramosus, cortice fusco atro quasi usto sulcis longitudinalibus confluentibus exarato obtectus, ligno albido molli, laminibus inconspicuis, radiis medullaribus paucis latiusculis; ramis brachiatis erecto-patentibus; ramulis teretibus crassitie pennæ corvinæ longe denudatis et cicatricibus horizontalibus annulatis, cortice castaneo nitido, apicibus solummodo foliosis. *Folia* fasciculata, pleraque stricta, erecta, e basi vaginante longissime lineari-subulata, supra pubescentia, v. subsericea, concava, subtus v. dorso glaberrima, convexa, subcarinata, margine integerrima sub lente per totam longitudinem ciliata, sensim acuminata apicibus pungentibus, coriacea, striata, læte viridia, 8 unc. ad pedalem longa, 3–4 lin. lata; plantis junioribus planiora, glabra, patentia, v. reflexa, graminea; vagina oblonga, basi amplexicaulis, striata, lamina duplo latior, ½–¾ unc. longa, margine scariosa, superne

ciliata, pallide brunnea, nitida; terra tota sub arboribus foliis emortuis delapsis sparsa. *Pedunculi* solitarii v. fasciculati, rarius plantis junioribus ad apices ramulorum terminales, plerique e ramis brevissimis laterales, 1½–2 unc. longi, stricti, erecti, inclinati, v. rarius nutantes, 7–10 flores; rachi terete glabra suflexuosa articulata ad nodos dilatata cyathiformi. *Pedicelli* breves, 1–2 lin. longi, cum rachi articulati. *Flores* subconferti, rarius secundi, erecti, demum nutantes, basi 2–4-bracteati. *Bracteæ* inferiores subfoliaceæ, flore longiores, interdum elongati; superiores ovatæ, obtusæ, striatæ, corollam subæquantes, marginibus scariosis ciliatis, demum deciduæ. *Calyx* 5-phyllus, foliola tubo corollæ paulo breviora, bracteis omnino similia, sed minora, intimis angustioribus submembranaceis. *Corolla* tubuloso-campanulata, ⅓ unc. longa, albida, tubo terete sub ore paulo constricto, limbo 5-fido, segmentis patentibus basi imbricatis late ovatis obtusis marginibus subundulatis, medio incrassatis, apice inflexo, præfloratione incurvo. *Stamina* 5, filamentis linearibus breviusculis infra faucem corollæ insertis; antheris parvis oblongo-quadratis, apicibus exsertis. *Pollen* stramineum, hyalinum, e sphærulis 3–5 conglobatis compositum. *Glandulæ hypogynæ* 5, ovario breviores, loculis oppositæ, oblongo-cuneatæ, superne truncatæ, retusæ. *Ovarium* sessile, late obovatum, 5-lobum, 5-loculare, loculis dorso sulcatis; ovulis plurimis elongato-pyriformibus, funiculis brevibus columnæ centrali affixis pendulis. *Stylus* validus, erectus, tubo ⅓ brevior, apice truncatus, 3–4-crenatus. *Capsula* coriacea, foliolis 2–3 calycinis persistentibus inclusa, loculicide 5-valvis. *Semina* immatura angulata; testa reticulata laxa.

A most abundant plant, forming a great portion of the woods which skirt the shores of these islands. The true *Dracophyllum longifolium* has hitherto been known to botanists only through the specimens collected by the Forsters during Cook's second voyage, and to some of the few who possess portions of the valuable collection formed by Mr. Menzies in Dusky Bay. Mr. Forster made full descriptions of his specimens, which have been published by M. Richard, and as a few discrepancies occur in comparing our own specimens with his, I shall here allude to them, premising that they only refer to such characters as depend much on the different localities the plant may inhabit. That the above-described plant is specifically the same as that gathered both by Forster and Menzies, is evident on the comparison of my specimens with the original drawing of that author. Thus, the leaves are described as smooth and reflexed: they are only so in the younger and more luxuriant state of the trees in Lord Auckland's Islands; as they grow larger and more exposed to the violence of the climate they become strict, erect, rigid, coriaceous and pubescent above, all of which characters Mr. Menzies' specimens possess, except that they are also smooth. Again, the spikes are solitary in the young trees, but in the older most frequently from 2–5 together; I have however never seen them nearly a palm long, or indeed more than two inches; in the British Museum drawings they are about that length. The tube of the corolla is hardly if at all longer than the calyx, and not "duplo longior," and its segments can hardly be considered as acute. The present species is certainly most nearly allied to the *D. squarrosum* (vide in note, p. 48), but the leaves are broader and more rigid, and the corolla of quite a different shape.

Plate XXXI. & XXXII. *Fig.* 1, flower with bracteæ; *fig.* 2, corolla removed; *fig.* 3, the same laid open; *fig.* 4, a hypogynous scale; *fig.* 5, ovarium and hypogynous scales; *fig.* 6, transverse section of the ovarium; *fig.* 7, longitudinal section of one cell of do.; *fig.* 8, unripe seed removed from do.:—all *magnified.*

2. Dracophyllum *scoparium*, Hook. fil.; arbuscula, ramis ramulisque fasciculatis strictis fusco-castaneis, foliis e basi vaginante gradatim angustatis lineari-subulatis strictis rigidis antice planis v. subcanaliculatis marginibusque pubescentibus dorso semiteretibus apicibus triquetris, floribus spicatis, spicis plurimis brevibus erectis sub 4-floris, bracteis foliolisque calycinis corollam superantibus omnibus late ovatis acuminatis marginibus ciliatis exterioribus foliaceis intus sericeis, corolla late campanulata tubo brevi, segmentis brevissimis late ovatis obtusis. (Tab. XXXIII.)

Hab. Campbell's Island; near the sea, not common.

Arbor humilis. *Caulis* ascendens, 6–8 pedalis, basi compressus ramosus, cortice et ligno ut in *D. longi-*

OFTHE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

Fitch del et lith.

prel: lith: Linn: imp.

Dracophyllum scoparium. Hook fil.

folio sed prioris colore pallidiore, ramis densis erectis, ramulis breviusculis fasciculatis gracilibus sub ¾ lin. diametro. *Folia* apicibus ramulorum conferta, omnia stricta, erecta, 1¼ unc. longa, ¾ lin. lata, fusco-viridia, intus marginibusque pubescentia, subsericea, vagina latiuscula, brunnea, superne attenuata. *Spicæ* numerosæ, inter folia confertæ, breviusculæ, ½–¾ unc. longæ, axillares et terminales, strictæ, erectæ, rarius nutantes, 3–4 flores, rachi articulata glabra castanea. *Flores* breviter pedicellati, pedicellis cum rachi articulatis pubescentibus. *Bracteæ* 2–3, corollam superantes, exteriores basi late vaginantes, deinde lineari-subulatæ ut folia sed breviores, coriaceæ, spicis æquilongæ, marginibus dorsoque carinato-ciliatis, intus sericeo-pubescentes, interiores minores. *Calycis foliola* ovata, acuta, striata, marginibus scariosis ciliatis, tubo corollæ breviora, persistentia. *Corolla* sub 1½ lin. longa, pro genere latissima, late campanulata, suburceolata, albida, inter bracteas occulta inconspicua, tubo brevi calycem vix superante, segmentis brevissimis late ovatis obtusis concavis, primum incurvis apice obtuso inflexo, demum patentibus subinvolutis. *Stamina* ad faucem inserta, parva, filamentis brevibus. *Capsula* late obovata, bracteis foliolisque calycinis persistentibus inclusa, valvis coriaceis obovatis apicibus incurvis medio septiferis; columna centralis valida, sublignosa, angulata, superne in ramos 5 pendulos clavatos fissa semina gerentes.

A very peculiar species, most nearly allied to the *D. Lessonianum*, A. Rich., and *D. Urvillianum*, A. Rich., but very distinct from both. It has also been gathered upon the Chatham Islands by Dr. Dieffenbach, in whose specimens the leaves are most beautifully margined, and the backs of the bracteæ covered with a silvery and velvety pubescence. I do not however place much reliance on the pubescence of any of the species of this genus, which appears a very variable character.

The genus *Dracophyllum* was established by Labillardière upon the *D. verticillatum*, a plant of New Caledonia (vide Voyage de Labill. vol. ii. p. 211. t. 40), and afterwards adopted by Mr. Brown, who added the *D. secundum* of Australia as a second species; both these have the flowers racemose or panicled, the bracteas caducous, and the stamens either hypogynous or inserted at the very base of the corolla. In a subgenus or section called *Sphenotoma*, the latter botanist included some other New Holland plants with spiked flowers, persistent bracteas, and stamens inserted upon the corolla; this has since been erected into a genus by Mr. Sweet (Fl. Austral. t. 44), and retained as such by all future authors. Mr. Brown having further remarked that some of Forster's New Zealand *Epacrideæ*, as *E. longifolium* and *E. rosmarinifolium*, Forst., belonged to the genus *Dracophyllum*, as modified by him, they were forthwith published as such by M. A. Richard, who added two more species to the genus, and also by Cunningham, who published a third (*D. latifolium*); but none of these authors proposed any sectional characters for these species, which differ most materially from those of Mr. Brown's first section of the genus, in many of them having epipetalous stamens, as also in the flowers being spiked and the bracteæ persistent, and which equally differ from *Sphenotoma* in habit and the form of the corolla. Lastly, M. DeCandolle, in 1839, remodelled the generic character of *Dracophyllum*, and, intending it to include only the plants of Mr. Brown's first section, described the calyx as "ebracteatus," and the stamens as "corollæ non adnata," both characters the opposite of what most of the New Zealand species exhibit.

Having received several allied new species of this genus from New Zealand, I shall add their characters here and give a conspectus of the whole, both for the purpose of showing the position of *D. longifolium* and *D. scoparium* in the series, as also because I am anxious to seize the first opportunity afforded me of laying the new species before the public and remodelling this fine genus*. I may here remark, that as a genus it is an exceed-

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* DRACOPHYLLUM, *Br.*

§ I. *Staminibus hypogynis, v. basi corollæ insertis.*

1. D. *secundum*, Br. *Brown, Prodr.* p. 556. *DeC. Prodr.* vol. vii. p. 769.

Hab. New Holland; in the neighbourhood of Port Jackson.

ingly natural one, *Richea*, Br., being its nearest ally and indeed its representative in Tasmania, whence Mr. Gunn has lately sent a splendid new species, probably the most magnificent plant in the whole Natural Order.

PLATE XXXIII. *Fig.* 1, a flower surrounded by the bracteæ; *fig.* 2, the same removed from the bracteæ; *fig.* 3, calycine leaf; *fig.* 4, segments of the corolla and stamens; *fig.* 5, germen and hypogynous scales; *fig.* 6, ripe capsule enclosed in the persistent bracteæ; *fig.* 7, the same with the bracteæ removed; *fig.* 8, the same split open; *fig.* 9, a valve of the capsule; *fig.* 10, a seed:—all *magnified*.

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2. D. *verticillatum*, Lab. *Labillardière, Voyage*, vol. ii. p. 211. t. 40. *DeC. l. c.* p. 770.

HAB. New Caledonia; on the mountains.

§ II. *Staminibus epipetalis, floribus paniculatis, bracteis caducis, foliolis calycinis tubo corollæ multo brevioribus.*

3. D. *latifolium*; arboreum, foliis $\frac{1}{2}$–$1\frac{1}{2}$ pedalibus longissime lanceolatis subflexuosis (pro genere latis) margine obtuse serrulatis, panicula effusa nutante pilosa demum glabra, bracteis deciduis, floribus parvis, foliolis calycinis æqualibus pubescentibus late ovatis corolla multo brevioribus.—*A. Cunn. Prodr. Fl. Nov. Zel. in Ann. Nat. Hist.* vol. ii. p. 48. *DeC. Prodr.* vol. vii. p. 770. Epacris longifolia, *Banks and Sol. MSS. in Mus. Brit.*

HAB. New Zealand; common in the woods of the Northern Island.

The most handsome but smallest-flowered species of the genus. Leaves an inch broad at the base. Panicle a foot long, very much branched.

4. D. *strictum*, n. sp.; arbuscula?, foliis 2–3 uncialibus late-subulatis suberectis strictis e basi vaginante gradatim acuminatis concavis marginibus serrulatis, panicula 2 unciali recta subcoarctata pilosa ramis crassis, bracteis deciduis, foliolis calycinis ovatis acutis tubo corollæ $\frac{1}{2}$ brevioribus, corolla majuscula 5 lin. longa.

HAB. New Zealand; Mountain of Tongariro: *Mr. Bidwill.*

Much smaller than the *D. latifolium*, and remarkably different in the size of the flower.

5. D. *affine*, n. sp.; arbuscula, foliis 2-uncialibus late-subulatis patentibus e basi lata vaginante gradatim acuminatis planiusculis, marginibus serrulatis, panicula 2-unciali nutante glabra effusa ramis tenuibus, bracteis deciduis, foliolis calycinis late-ovatis acutis tubo corollæ $\frac{1}{3}$ brevioribus, corolla $2\frac{1}{2}$ lin. longa.

HAB. New Zealand; mountains of the interior: *Dr. Dieffenbach.*

At first sight this much resembles the last species, but it has much smaller flowers and is otherwise very distinct.

§ III. *Staminibus epipetalis, floribus spicatis (unica specie solitariis), foliolis calycinis bracteis simillimis tubo corollæ æquilongis.*

6. D. *longifolium*, v. supra.

HAB. New Zealand; in Dusky Bay, and Lord Auckland and Campbell's Islands.

7. D. *squarrosum*, n. sp.; arbuscula, foliis 3–4 uncialibus patentibus squarrosis subgramineis (junioribus strictis) e basi subscariosa vaginante gradatim lineari-subulatis glaberrimis marginibus serrulatis concavis, spicis $1\frac{1}{2}$–2 uncialibus lateralibus fasciculatis 5–6-floris, bracteis foliolisque calycinis ovato-lanceolatis gradatim acuminatis florem superantibus, corollæ tubo gracili, limbi segmentis lanceolatis obtusis.

HAB. New Zealand; Northern Island, Manukau Bay: *W. Colenso, Esq.*

A small diffuse tree, 12–14 feet high, allied to *D. longifolium*, but the leaves are of a different habit and texture, and the corolla quite unlike that of the southern plant: both of these have large leaves, and more the

XIX. MYRSINEÆ, *Br.*

Tribe EMBELIEÆ, *A. DeC.*

1. SUTTONIA, *A. Rich.*

Flores polygami, v. hermaphroditi. *Calyx* 2–5-partitus rarius obsoletus, lobis obtusis, eroso-dentatis, ciliatis, æstivatione imbricatis. *Corollæ petala* 4–5, distincta, v. rarius ima basi subconnata, obovata v. lineari-oblonga,

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appearance of the species of the former sections. The following are more shrubby, and though of a different habit, I am unable to separate them by any decided character into a distinct section.

8. D. *Lessonianum*, A. Rich.; frutescens, ramis castaneis, foliis fasciculatis 2½–3-uncialibus lineari-subulatis semiteretibus supra planis, vaginis elongatis abrupte truncatis marginibus ciliatis, spica 1½–2 unciali 5–8-flora, floribus remotis, bracteis foliisque calycinis persistentibus coriaceis flore longioribus gradatim acuminatis, corollæ segmentis oblongo-lanceolatis tubo subgracili.—*A. Rich. Flor. Nov. Zel.* p. 233. *A. Cunn. Prodr. Fl. Nov. Zel. l. c. DeC. Prodr. l. c.* D. attenuatum, *A. Cunn. MSS. in Herb. Hook.* Ardisia frondosa, *α.* longifolia, *Banks and Sol. MSS. in Mus. Brit.*

Hab. New Zealand; a very common plant in the Northern Island, also found on the Middle Island.

9. D. *Urvilleanum*, A. Rich.; frutescens, ramis atris, foliis fasciculatis 2½–3-uncialibus strictis supra canaliculatis, vaginis brevibus subciliatis, spica ½ unc. longa 3–4-flora, floribus approximatis, bracteis persistentibus foliolisque calycinis ovatis breviter acuminatis, corollæ segmentis ovato-oblongis tubo subcampanulato.—*A. Richard, A. Cunningham et DeC. locis citatis.* Ardisia frondosa, *β.* squarrosa, *Banks and Sol. MSS. in Mus. Brit.*

Hab. New Zealand; Northern Island, generally at a little distance from the sea; Tasman's Bay, Middle Island: *D'Urville.*

Stems always black and as if charred on the surface. This and the preceding are very closely allied, but assuredly quite distinct; the most prominent characters of the present are the shortly acuminated bracts, abbreviated spikes, and channeled leaves; other distinctions are well pointed out by A. Richard, to which DeCandolle adds "foliis rigidis," though in our specimens they are less so, if anything, than in *D. Lessonianum*, but rather shorter. Cunningham appears to have confounded the two, though he knew both plants, this being the common species on the banks of the Keri-Keri river. His MSS. name of *D. attenuatum* is also attached by himself to specimens (in Herb. Hook.) of *Lessonianum* and not of *Urvilleanum*, under which, in his 'Prodromus,' he quotes his own name as a synonym.

10. D. *scoparium*, Hook. fil.; v. supra.

Hab. Chatham and Campbell's Islands.

11. D. *robustum*, n. sp.; fruticosum, ramis fuscis, foliis fasciculatis 1½–2-uncialibus subcurvatis semiteretibus rigidis supra planis, vaginis basi abrupte truncatis ciliatis, spica ¾–1 unc. longa valida 3–4-flora, floribus confertis, bracteis persistentibus foliolisque calycinis rigidis duris ovato-lanceolatis gradatim acuminatis, corollæ tubo subgracili segmentis ovali-oblongis.

Hab. New Zealand; Northern Island: *Edgerley.*

This is a very distinct species though similar to the three former, and having leaves, though shorter and more rigid, of the same character as those of *D. Lessonianum*, as are the calycine leaves, flowers and segments of the

primum erecta, concava, demum patentia et sæpe revoluta, ciliata, æstivatione imbricata, quincuncialia. *Stamina* tot quot petala, prope basin corollæ inserta; filamentis breviusculis, linearibus; antheris ovato-lanceolatis,

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corolla, in all which respects it differs from *D. Urvilleanum*, but agrees with that plant in the few-flowered spike.

12. D. *subulatum*, n. sp.; fruticosum, ramis fuscis parce foliosis gracilibus, foliis fasciculatis e basi lata vaginante lineari-subulatis $\frac{1}{2}$–$\frac{3}{4}$-uncialibus strictis erectis rigidis subtriquetris, vaginis latiusculis sub lente ciliatis, spicis $\frac{1}{4}$–$\frac{1}{3}$-uncialibus lateralibus ramulisque brevissimis terminalibus 2-floris, floribus parvis approximatis, bracteis persistentibus florem superantibus foliolisque calycinis late ovatis acutis v. acuminatis, corollæ tubo campanulato, segmentis latis.

Hab. New Zealand; mountainous interior of Northern Island: *J. T. Bidwill, Esq.*, and *W. Colenso, Esq.*

A very distinct plant, readily recognised by the small size of all its parts.

13. D. *rosmarinifolium*, Br.; fruticosum, ramis apice foliosis, foliis $1\frac{1}{2}$-uncialibus erectis rigidis coriaceis apice obtusis dorso convexis subcarinatis striatis antice canaliculatis basi modice dilatatis vaginantibus, floribus sessilibus solitariis, bracteis lanceolatis acutis, corollæ segmentis ovatis obtusis.—*Forst. MSS. in A. Rich. Fl. Nov. Zel.* p. 220. *Brown. Prodr.* p. 556. *A. Rich. A. C. Prodr. et DeC. locis citatis.* Epacris rosmarinifolia, *Forst. Prodr. n.* 69.

Hab. "Summis Alpibus Novæ Zelandiæ;" *G. Forster.*

"Hæc forte species ex *E. longifolia* enata, solo ingratiore et frigidiore pumila evasit, foliaque longa floresque racemosos amisit."—*Forst. MSS. l. c.*

In Lord Auckland's group the *D. longifolium* assumes no such form, and from the British Museum specimens this appears to be an entirely different species from any other.

14. D. *recurvum*, n. sp.; suffruticosum, ramis ad apices tantum foliosis, foliis uncialibus e basi vaginante linearibus gradatim attenuatis obtusis recurvis supra canaliculatis subtus convexis.

Hab. New Zealand; Tongariro: *Mr. Bidwill.*

Apparently a very small plant, 4–5 inches high, the branches terete, fuscous-black, above transversely scarred. In consequence of the blunt apices of the leaves I have placed this near *D. rosmarinifolium*, but I much regret having neither flowers nor fruit.

RICHEA, *Br. Prodr.* p. 555.

1. Richea *dracophylla*, Br. Prodr. l. c. DeC. Prodr. vol. vii. p. 769.

Hab. Tasmania; on the high mountains, especially in the southern and western parts of the island.

2. Richea *pandanifolia*, n. sp.; caule erecto simplici 15–25-pedali apice tantum folioso, foliis crassis valde coriaceis 3–4-pedalibus squarroso-recurvis e basi vaginante lanceolata longissime lineari-subulatis superne planis marginibus argute serratis cartilagineis, paniculis axillaribus ovatis effusis basi spathaceo-bracteatis, floribus parvis breviter pedicellatis, pedicellis bracteolatis, bracteolis 1 v. 2 lineari-subulatis fugacibus, corolla clausa calyptræformi, filamentis ovario vix $\frac{1}{2}$ longioribus.

Hab. Tasmania; Port Davy, Peak of Teneriffe, Frenchman's Cap, and several other mountainous situations, especially in the southern parts of the island: *Backhouse MSS. (in Bibl. Hook.) and in Ross' Hobartown Almanack, R. C. Gunn, Esq.*

I am indebted to Mr. Backhouse's valuable 'MSS. Notes on Australian Botany' for information concerning

OF THE BOMBAY BRANCH OF THE ASIATIC SOCIETY

Fitch del. et lith.

Suttonia divaricata. Hook. fil.

prel. lith. Linn. imp.

basi cordatis, bilocularibus. *Pollen* sphæricum. *Ovarium* ovatum, in stylum brevem attenuatum, 1-loculare, 1- rarius 2-ovulatum, ovulis latere placentæ globosæ carnosæ immersis. *Stigma* capitatum, cyathiforme, rarius infundibuliforme, varie divisum, crenatum v. lobatum, interdum fimbriatum. *Fructus* baccatus, putamine crustaceo, 1-loculari. *Semina* 1 v. 2, reliquiis membranaceis placentæ indusiata, subglobosa, interdum latere transversim constricta; testa membranacea; albumine corneo, albido. *Embryo* filiformis, cylindraceus, oblique transversus, paulo arcuatus v. sigmoideus.—Frutices *vel* arbusculæ *Novæ Zelandiæ et insularum Norfolciæ Auckland et Campbell, glabræ, glanduloso-punctatæ.* Folia *varia, plerumque subcoriacea, integra, venosa.* Pedunculi *laterales, fasciculati, bracteati.* Flores *parvi.*—Character genericus a Flora Novæ Zelandiæ Ach. Richardi (p. 349) emendatus.

1. SUTTONIA *divaricata,* Hook. fil.; fruticosa, ramis divaricatis arcuatis tortuosis parce foliosis, foliis ad apices ramulorum lateralium 2–4 breviter petiolatis late-obovatis retusis v. obcordatis coriaceis, pedunculis brevibus curvatis lateralibus basi squamosis, calycis 4–5-fidi lobis obtusis, petalis obovatis. (TAB. XXXIV.)—Myrsine? divaricata, *A. Cunn. Flor. Nov. Zel. in Ann. Nat. Hist.* vol. ii. p. 47. *Alph. DeC. in Prodr.* vol. viii. p. 95.

HAB. Lord Auckland's group and Campbell's Island; abundant in woods near the sea, never ascending the hills.

Frutex, rarius *arbuscula,* erectus, ramosus, parce foliosus, rigidus, primo intuitu spinescens, facie *Coprosmæ,* 4–8-pedalis. *Radix* lignosa, diffusa. *Truncus* brevis, subpedalis, cylindraceus, prope basin diametro 10–12 uncias; cortice atro, transversim rugoso, subannulato; ligno duro, albo. *Rami* divaricati, horizontaliter patentes, apicibus plerumque deflexis, lignosi, tenaces, gemmis basibusque ramulorum delapsorum tuberculati, cortice fuligineo v. atro-fusco obtecti; ramulis brevibus, subdistiche divaricatis, interdum pubescentibus, apicibus tantum foliosis. *Folia* parva, $\frac{1}{3}$ unc. longa, ramulis ultimis alterna, vel plerumque 2–3 ad apices fasciculata, rarius solitaria, horizontaliter patentia, late obovata et retusa, v. obcordata, basi in petiolum brevem attenuata, integerrima, glaberrima, planiuscula v. concava, subcoriacea, nervis prominulis utrinque reticulata, glandulis sparsis, majusculis, elevatis, aurantiacis, pellucidis punctata, et serie intramarginali circumdata, supra læte viridia, nitida, subtus pallidiora; petiolo brevi, glabro v. pubescente, supra canaliculato, $\frac{3}{4}$ lin. longo. *Flores* parvi, inconspicui, breviter pedunculati, ramis ramulisque lateralibus 2–4 glomerulati. *Pedunculi* arcuati, 1–$1\frac{1}{2}$ lin. longi, basi pluribracteolati, e gemmulis squamosis orti; bracteolis minimis, ovato-rotundatis, brunnei marginibus scarioso-membranaceis. *Calyx* parvus, obovatus, carnosus, 4- rarius 5-fidus; lobis suberectis v. patulis, late ovatis, obtusis, glanduloso-punctatis, marginibus erosis, ciliatis. *Petala* 4–5, basi remota, infra faucem calycis inserta, patentia, persistentia, demum basi ovarii crescentis appressa, obovato-oblonga, apice rotundata, $\frac{1}{4}$ lin. longa, subchartacea, rufo-brunnea, glanduloso-punctata, margine membranaceo, pellucido, eroso, cilato v. subfimbriato, pilis breviusculis, articulatis, flexuosis, medio uninervia, nervo obscure ramoso. *Stamina* 5, petalis $\frac{1}{2}$ breviora; filamenta brevia, linearia, compressa, crassa, supra basin petalorum affixa; *antheræ* coriaceæ, filamento longiores, oblongo-lanceolatæ, subacutæ, basi cordatæ, valde compressæ, per totam longitudinem rimis lateralibus dehiscentes. *Ovarium* ovato-ampullaceum, teres, in stylum validum brevem attenuatum, 1-loculare, 1-ovulatum; placenta carnosa et subaquosa, globosa, ovarii loculum implens, basifixa, latere unico excavata; ovulum solitarium, conico-pyriforme, horizontale, funiculo brevi, fundo cavitatis placentæ affixum. *Stigma* capitatum, forma varians, sæpe lobatum v. crenatum, nunc excavatum, cyathiforme, mar-

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this splendid plant, and to Mr. Gunn for magnificent specimens. It is known to very few of the inhabitants of the colony, in consequence of the remoteness and inaccessible nature of the localities it inhabits. Amongst the bushrangers it is called "cabbage-tree," and was always described by them as resembling an American aloe placed on the top of a long pole. I shall have a further opportunity of making some remarks upon it in the Flora of Tasmania.

ginibus integris, varie lobatis vel fimbriatis, raro in acetabulum dilatatum. *Bacca* sphærica, valde depressa, pallide cærulea, 2–3 lin. diametro, breviter pedunculata; epicarpio tenui, membranaceo; sarcocarpio spongioso, insipido, albido; putamine ovato-globoso, crustaceo, extus venoso, venis basi ad apicem radiantibus. *Semen* unicum, majusculum, reliquiis exsiccatis tenuiter membranaceis brunneis placentæ circumdatum, sphæricum, latere unico medio valde constrictum; testa membranacea, tenui, prope hilum subplicata, pallide fusca; albumine duro, corneo, albido. *Embryo* teres, filiformis, axi seminis contrarius, oblique transversus; radicula elongata; cotyledonibus parvis, semiteretibus.

This is not an uncommon plant in the woods at the sources of rivers which fall into the Bay of Islands, New Zealand, and it has also been gathered in other parts of the Northern Island of New Zealand, where it assumes a more straggling and less woody appearance than the Auckland Island specimens present. It is the only shrub which in this longitude inhabits a level so nearly that of the ocean in the respective latitudes of 35° and 52½° S. Mr. Cunningham, who first detected this species, describes the berries as spotted with black; in the southern specimens, which may in this respect be a variety, they are of a uniform pale blue, and quite unmarked.

I have ventured to retain M. A. Richard's generic name of *Suttonia* for this and several other *Myrsineæ* of New Zealand, and though that author gives no etymology of the name, I cannot but suppose it was adopted as a well-merited compliment to the Rev. Dr. Sutton of Norwich, one of the original members of the Linnæan Society of London, and author of an excellent paper on the British species of *Orobanche*, read before that Society in 1797 (vide Linn. Soc. Trans. vol. iv. p. 193).

The other species which will be included under *Suttonia*, as above characterized, are (1.) *S. australis*, A. Rich. (*Myrsine Urvillei*, Alph. DeC.; *Myrsine undulata*, A. Cunn.; *Merista lævigata*, Banks and Sol. MSS.); (2.) *S. tenuifolia**, n. sp.; (3.) *S. salicina* (*Myrsine salicina*, Hew. MSS.). All these have the petals free, except the last, in which they are slightly adherent at the base, and they further differ from *Myrsine* in having solitary or rarely (in *M. salicina* alone) two ovules and seeds. The original discoverers of the genus were Sir J. Banks and Dr. Solander, who, accompanying Captain Cook during a five-months' investigation of various parts of the shores of New Zealand, were the first Europeans that ever landed there, and the indefatigable collectors of most of the singular and new forms of plants with which those islands abound. The name *Merista*, given by them to one of the species, was probably adopted in allusion to the division of the corolla. The drawing and description of M. Richard were made from very imperfect specimens, and the genus incorrectly referred to *Terebinthaceæ*.

The *Myrsineæ* are for the most part inhabitants of climates whose temperature is equable, and they particularly abound in insular localities, as the islands of the Indian Ocean, Mauritius, Bourbon, and Madagascar. Their utmost northern limit in the old world seems to be the Azores, lat. 39° N., Madeira, lat. 32°, and Teneriffe; but in no part of the adjacent continent of Africa do they cross the northern tropic; in Europe they are entirely wanting, and in Asia extend only to Japan, in north latitude 40°. The order is very rare in North America, and especially to the northward of Mexico, only one species inhabiting the United States, the *M. Floridana*, A. DeC., and that is confined to the southern state whose name it bears, lat. 30° N. In the southern hemisphere they nowhere (except in New Zealand) are found to the southward of the 36th parallel, and there in S. Brazil only. In Africa they reach the 33rd, and the 34th in Australia. Their extension into the 53rd degree in the

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* Suttonia *tenuifolia*, n. sp.; arbuscula, foliis petiolatis ovatis vel ovalibus obtusis tenuibus submembranaceis integerrimis reticulatim venosis punctis glandulosis parvis, fructibus globosis solitariis v. binis pedicellatis.

Hab. Norfolk Island, on the skirts of woods: *A. Cunningham* (in Herb. Hook.).

A larger and more membranous-leaved species than the *S. australis*, to which it is nearly allied.

Fitch del et lith.

prel: lith: Linn: imp:

Gentiana concinna. Hook. fil.

South Pacific Ocean is hence a remarkable circumstance, and probably in some measure to be accounted for by the uniform temperature which the New Zealand Islands possess; they further there bear a larger proportion to the other dicotyledonous vegetation than they do in any other part of the globe. I have alluded to the *S. divaricata* having a considerable range in latitude, a circumstance not without parallel in the order to which it belongs. Of this *M. Africana*, L. is an extreme instance, that plant being found both at the Cape of Good Hope, in Abyssinia, and in the Azores Islands. The species of the Natural Order are however, as M. A. DeCandolle well remarks (Linn. Trans. vol. xvii. p. 99), very confined as regards their geographical limits, *Melastomaceæ* and *Myrtaceæ* being two of the very few groups containing about the same or a greater number of species which are more so.

PLATE XXXIV. *Fig.* 1, a flower; *fig.* 2, the same laid open; *fig.* 3, a petal and stamen; *fig.* 4, a flower with the germen more advanced; *figs.* 5, 6 and 7, various forms of stigmata; *fig.* 8, half-ripe berry; *fig.* 9, longitudinal section of the same; *fig.* 10, placenta and young seed; *fig.* 11, the same cut open longitudinally; *fig.* 12, young seed; *fig.* 13, ripe berry; *fig.* 14, longitudinal section of the same; *fig.* 15, seed covered with the shrivelled remains of the placenta; *fig.* 16, seed removed from do.; *fig.* 17, longitudinal section of seed showing the embryo; *fig.* 18, embryo removed:—all *magnified.*

XX. GENTIANEÆ, *Juss.*

1. GENTIANA (Antarctophila, *Griseb.*) *concinna*, Hook. fil.; annua, caule breviusculo ramoso, ramis teretibus suberectis v. patulis foliosis, foliis coriaceis elongato-spathulatis obtusis marginibus minutissime serrulatis, floribus confertis paniculatis inter folia sessilibus v. brevissime pedunculatis, segmentis calycinis linearibus corolla $\frac{1}{2}$ brevioribus, corolla campanulata limbi lobis obovato-oblongis obtusis albidis rubro pictis, glandulis fauce corollæ 5 orbiculatis subdepressis, antheris post anthesin extrorsis. (TAB. XXXV.)

Var. β. *elongata*; caule ascendente spithameo vage ramoso, foliis majoribus subtus 3-costatis, floribus albidis rubro-purpureo pictis.

Var. γ. *robusta*; caule erecto crasso simplici v. ramoso, foliis lanceolatis obtusis subtus 3–5-costatis.

HAB. Lord Auckland's group; on the bleak and exposed faces of the mountains. β. amongst rocks and in sheltered situations on the tops of the hills. γ. Campbell's Island; on the hills, abundant.

Radix simplex, elongato-fusiformis, 1–2 unc. longa, descendens, hinc illinc fibrosa, sæpe multiceps, intus lutea, sapore amaro. *Caules* solitarii v. plures, perbreves, erecti, $1\frac{1}{2}$–3 uncias longi, nunc ex ima basi dichotome ramosi, rarius solitarii, inferne simplices, elongati, superne fastigiatim ramosi. *Rami* abbreviati, rarius 1–2 uncias longi v. ultra, erecti, teretes, foliosi, crassitie pennæ passerinæ, superne et ramuli laterales floriferi. *Folia* inferiora seu radicalia conferta, plerumque stellatim patentia, rarius laxa et suberecta v. stricta, sæpius plus minusve recurva, elongato-spathulata, in petiolum gradatim attenuata, latitudine varia, $\frac{3}{4}$–1 unc. longa, supra medium 4 lin. lata, coriacea, marginibus recurvis, sub lente minutissime cartilagineo-serrulatis, medio uninervia, et nervis duobus lateralibus interdum obsoletis, superne convexiuscula, canaliculata, subtus costa elevata, læte flavo-viridia, fusco purpureove picta, siccitate corrugata; folia caulina breviora; petiolus latiusculus, marginibus basi membranaceis. *Inflorescentia* paniculata, sed ramis valde abbreviatis, foliosis, foliis superioribus multoties brevioribus, ita ut flores videantur glomerati, paucique inter folia summa sunt solitarii. *Calyx* 5-fidus, tubo brevi, obconico, segmentis lineari-oblongis, obtusis, coriaceis, dorso subacutis, corolla $\frac{1}{2}$ brevioribus, viridibus,

versus apices purpurascentibus. *Corolla* campanulata, 5-fida, subrotata, 4–5 lin. longa; tubo brevi, urceolato, pallide flavo, supra medium glanduloso, glandulis 5 majusculis, orbiculatis, depressis, pallide viridibus; lobis obovato-oblongis, obtusis, concavis, integerrimis, æstivatione dextrorsum contortis, tubo duplo longioribus, albidis, basi macula nervisque latis pulcherrime rubris, siccitate pallide flavis. *Stamina* tubo corollæ infra faucem inserta, lobis glandulisque alterna, inclusa; *filamentis* validis, lineari-subulatis, elongatis, erectis, purpureis, apicibus arcuatis, primum incurvis, demum recurvis; *antheris* versatilibus, oblongo-quadratis, violaceis, loculis lineari-oblongis, rimis longitudinalibus antice dehiscentibus, post anthesin (ob apicem filamenti reflexum) posticis. *Pollen* stramineum, ellipticum, læve, 3-lobatum, utrinque subacutum. *Ovarium* lineari-lanceolatum, basi in pedicellum breve contractum, superne in stylum validum, gradatim attenuatum, compressum, 1-loculare, pluri-ovulatum; *ovula* biserialia, placentis suturalibus funiculis brevissimis adnexis, anatropis; *stigmata* 2, patentia, carpophyllis contraria, subcapitata. *Capsula* lineari-oblonga, v. lanceolata, $\frac{1}{4}$ unc. longa, submembranaceo-coriacea, valvis planiusculis, dorso medio sulcatis. *Semina* numerosa, minuta, biserialia, globosa, subangulata; *testa* membranacea, pallide fusca, albumini carnoso appressa.

This elegant little species is one of the most attractive plants on the exposed hills, flowering copiously in November and December. The variety β. is rather uncommon and seldom flowers; its appearance is more that of a large leafy state than of perfect or characteristic specimens. The γ. I have never found in flower, and it may prove a distinct species, though the roots are annual and its leaves of the same nature as some of the larger specimens of *G. concinna*. The former of these varieties approaches the *G. montana*, Forst., of New Zealand, Tasmania and Australia, itself a very variable plant, according to our own and Forster's original specimens in the British Museum, and to the description of Forster quoted by Richard (Fl. Nov. Zel. p. 203), and the works of Brown and Grisebach (Gen. et Sp. Gentian. p. 235). All the states of the latter however differ from this in the much larger flowers, acute lobes of the corolla, and long peduncles of the flowers. The present plant affords further a proof of a certain similarity in the whole Flora of the south circumpolar regions, a peculiarity more strongly marked in the analogous latitudes of the Northern hemisphere, where large tracts of land with a concomitant vegetation are situated nearer the pole. I must confess that I have much difficulty in recognising more than one species in Tasmania, which is itself closely allied to several South Chilian and Patagonian plants, as *G. Patagonica*, Griseb., *G. multicaulis*, Gill. and *G. diffusa*, H. B. K.

I am here anxious to correct an error I have fallen into, in considering the *G. Grisebachii* (Hook. fil. in Ic. Pl. t. 636) as distinct from *G. montana*, Forst.; I have lately had the opportunity of examining large suites of specimens of the true plant, of which the *G. Grisebachii* is decidedly a small state. And so also with regard to the *G. bellidifolia* (Ic. Pl. t. 635); though different from the ordinary states of Forster's *G. saxosa*, and especially from the specimens from which he made his drawings, it is not specifically distinct from other states which have been gathered by Forster, but which, when the *G. bellidifolia* was published, I had not the opportunity of examining.

Plate XXXV. *Fig.* 1, a flower; *fig.* 2, corolla removed from the same; *fig.* 3, corolla laid open; *figs.* 4, 5 and 6, stamens and anther; *fig.* 7, pollen; *fig.* 8, ovarium; *fig.* 9, one valve of do. and ovules; *fig.* 10, capsule; *fig.* 11, seeds:—all *magnified*.

2. Gentiana (Andicola, *Griseb.*) *cerina*, Hook. fil.; perennis, caule prostrato vage ramoso, ramis ad apices adscendentibus, foliis cartilagineo-carnosis obovato-spathulatis obtusis vel retusis 3-nerviis in petiolum latum attenuatis, floribus inter folia summa confertis sessilibus, corolla late campanulata subrotata lobis oblongo-lanceolatis obtusis albidis purpureo-venosis, tubo glandulis depressis 5, antheris post anthesin extrorsis. (Tab. XXXVI.)

Hab. Lord Auckland's group; near the sea on rocky islets in Rendezvous Harbour.

Radix fusiformis, elongata, 3–4 unc. longa, cortice crasso, fusco, transversim rugoso tecta, inferne divisa,

BRANCH OF THE ... ASIATIC SOC.

Plate XXXVI.

Finch del et lith.

prel. lith. Linn. imp.

Gentiana cerina Hook. fil.

superne plantis junioribus multiceps, ad collum foliosa, vetustioribus caules plurimos vel solitarios emittens. *Caules* prostrati, elongati, 4 unc. ad pedem longi, 2–3 lin. diametro, crassi, subsucculenti, teretes, siccitate subangulati, e basi ramosi, per totam longitudinem foliosi v. inferne nudi, e foliis inferioribus deciduis annulati, internodiis $\frac{1}{2}$–$\frac{3}{4}$ uncialibus, superne incrassati, apicibus ascendentibus, ramis abbreviatis sæpius floriferis. *Folia* numerosa, inferiora, præsertim exemplaribus ramosis junioribusque, latiora, rosulata, circa collum stellatim patentia, omnia plus minusve recurva, late spathulata, obtusa, retusa, v. emarginata, marginibus integerrimis, interdum recurvis, 1–1$\frac{1}{2}$ unc. longa, $\frac{1}{4}$–$\frac{1}{2}$ unc. lata, 3-nervia et reticulatim venosa, nervis subtus prominulis, læte sed pallide viridia, nitida, purpureo picta, siccitate fusca et nigrescentia, interdum membranacea; petiolo lato, superne plano, subtus convexo, deorsum dilatato, semiamplexicauli, cum caule articulato. *Inflorescentia* verosimiliter paniculata, sed ramis obsoletis et pedunculis abbreviatis, hinc flores ut videtur solitarii v. bini, et inter folia subsessiles. *Flores*, solummodo plantis junioribus visi, iisque ramis caulibusque abbreviatis. *Calyx* campanulatus, 5-fidus, segmentis late linearibus, obtusis, corolla $\frac{1}{3}$ brevioribus, 3-nerviis, apicibus recurvis. *Corolla* late campanulata, subrotata, 4–5 lin. longa, albida, 5-fida, lobis late obovato-oblongis, obtusis, concavis, 5–6 nerviis, nervis rubro-purpureis;—*glandulis, staminibus, ovario*que ut in *G. concinna*.

During our stay in Lord Auckland's group I much regretted being unable in my drawings, to imitate the pellucid and waxy appearance, especially of the flowers and leaves of this most beautiful plant, to which in other respects the artist has done ample justice. It bears nearly the same relation to the *G. saxosa*, Forst., as the former-described species does to *G. montana*. Though placed by Dr. Grisebach (in his excellent Essay on *Gentianeæ*) in separate sections of that genus, there appears to me to be but little to remove these two species far from one another, except the annual root of one. As is the case with *G. saxosa*, the leaves of this are variable in breadth, but not to the same extent, and it entirely differs from that plant in the prostrate habit of growth, very short peduncles of the flowers, and in the broader and shorter corollas, which are not much longer than the lobes of the calyx. The anthers in all the New Zealand as in the Tasmanian species are versatile on the apex of the filament, which is curved and at first projects forward; after the discharge of the pollen, or rather the first dehiscence of the anthers, the apex of the filaments immediately becomes erect and then reflexed, whence in the expanded flowers the anthers are almost invariably found to be extrorse. Although Gentians are seldom white-flowered as species, this and the former are decidedly so, with red or red-purple at the base of the segments, and the veins of the same colour; the pure blue of the European species is unknown amongst those of these regions, or of the higher latitudes of South America. Indeed I think that few genera display so full a series of colours in the flowers as this does; red, blue, yellow and white are all exhibited in it, with many of the intermediate compound tints. Yellow and white are rare in the regions of the Gentians, but almost invariably present; the red species are nearly confined to the Andes of South America and New Zealand. Amongst Dr. Jameson's 'Botanical Notes on the Flora of the Andes of Peru and Colombia' I find the following interesting remark: "Of sixteen species of Gentian with which I am acquainted, one-half are red, four purple, two blue, one yellow, and one white." (Bot. Journ. vol. ii. p. 649.) Their inferior limit under the line we find from the same source to be 7852 feet, and they ascend from thence nearly to the limits of perpetual snow on Cotopaxi*; they do not in South America descend to the level of the sea in a lower latitude than 54° or thereabouts, where however there are no alpine species, though the snow-line does not descend below 4000–3500 feet†. In the Himalayah, where the species are all blue-flowered, one species has been gathered by my friend Mr. Edgeworth near Ratha Kona, on the Mána Pass, at an elevation of 16,000 feet, near the limit of perpetual snow; and another reaches in lat. 31° N. the altitude of

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* 15,646 feet, Jameson, l. c. p. 657. The mean lower limit of perpetual snow on the Andes under the equator is at an altitude of 15,748 feet, according to Humboldt; and 15,496 from the mean on six mountains measured by Dr. Jameson.

† King, in Journ. Roy. Geog. Soc. vol. i. p. 165. Darwin, Journ. p. 277.

12,689 feet, according to Dr. Royle (Illust. Plant. Himmal. vol. i. pp. 22 and 278). In Ceylon a species has been gathered at between 6000 and 8000 feet of elevation. One species, *G. prostrata*, H. B. K., has a most extraordinary range, both in longitude and latitude: in southern Europe it inhabits the Carinthian Alps, between 6000 and 9000 feet high; in Asia it has been found on the Altai mountains about lat. N. 52°. Its American range is much more remarkable, it having been gathered on the tops of the Rocky Mountains in lat. 52° N., where they attain an elevation of 15,000–16,000 feet, and on the east side of the Andes of South America in 35° S.: it descends to the level of the sea at Cape Negro; in the Straits of Magalhaens in lat 53° S.; and at Cape Good Hope in Behring's Straits, lat 68½° N.

The fact of the occurrence, and the great number, of species of *Gentiana* inhabiting only the more elevated regions of the temperate and tropical zones, and there reaching the snow limit, renders it very remarkable that they should be so proportionally scarce in the higher latitudes both of the northern and southern hemispheres. Generally speaking, the inhabitants of these elevated and cold regions are species of such Natural Orders and genera as compose the mass of the Polar vegetation. It is so to a great extent with certain groups of *Ranunculaceæ*, of *Gramineæ*, *Caryophylleæ*, *Cruciferæ*, *Ericeæ*, &c. &c., but not with *Gentianeæ*; the proportion which the species of the transition temperate zones bear to the other plants of those regions on the one hand, and to the tropical species of the same genus on the other, is in both cases remarkably small. They are entirely unknown to the Floras of the Polar American Islands; very few inhabit Greenland, Iceland, or the Arctic seashores in the North, or Tasmania, New Zealand, Fuegia, or the Antarctic Islands in the South; and again in other parts of N. Europe and America, or of Chili and Patagonia, they are infinitely less numerous than in the Alps of Middle and South Europe, or the Andes of the equator.

Plate XXXVI. *Fig.* 1, flower; *fig.* 2, corolla; *fig.* 3, stamens; *fig.* 4, ovarium:—all *magnified*.

XXI. BORAGINEÆ, *Juss.*

1. Myosotis *capitata*, Hook. fil.; radice perenni multicauli, caulibus validis ascendentibus foliosis pilosis pilis patentibus, foliis lineari-oblongis v. subspathulatis obtusis supra sericeo-pilosis rarius subhispidis subtus pilis laxioribus glabriusculisve, racemis capitatis densifloris simplicibus v. conjugatis foliis supremis brevioribus, calyce cylindraceo, corollæ tubo terete calycem ½ superante limbi lobis planiusculis rotundatis. (Tab. XXXVII.)

Hab. Lord Auckland's group; on gravelly banks near the margins of the woods, close to high-water mark.

Radix crassa, elongata, 2–3-pollicaris, diametro pennæ anatinæ, horizontalis et descendens, per totam longitudinem fibras crassas, simplices vel fibrillosas emittens, fusco-nigra, ad apicem bi- tri-multiceps, reliquiis foliorum vetustorum subsquamosa. *Caules* simplices, ascendentes, rarius lateralibus prostratis, apicibus tantum erectis, crassi, 4 unc. ad spithamæam longi, ¼ unc. lati, teretes, pilosi, pilis mollibus, patentibus, hic illic densis, foliosi. *Folia* plurima, radicalia, seu caulibus abbreviatis fasciculata, patentia, lineari-oblonga, obtusa rarius basi attenuata et spathulata, 1½–2 unc. longa, 4–6 lin. lata, plana, medio uninervia, venis lateralibus reticulatis, obscuris, supra pilosa, pilis appressis, subsericeis, simplicibus, albidis, vetustiora scabriuscula pilis basi globoso-incrassatis, subtus glabra vel parce pilosa, pilis laxis, mollibus, undique patentibus, basi glabra, lata, semiamplexicaulia, marginibus ciliatis, caulina minora, suberecta v. recurva, basi marginibus membranaceis, suprema plerumque racemum superantia. *Racemus* terminalis, breviter pedunculatus, solitarius, simplex vel furcatus, interdum conjugatus, in capitulum circinatum volutus, pluriflorus, ebracteatus. *Flores* conferti, erecti, breviter pedicellati, pedicellis hirsutis sub lineam longis. *Calyx* elongatus, cylindraceus, 1½ lin. longus, hirtus, lobis elongatis, lineari-oblongis, obtusis, obscure 3-nerviis. *Corolla* hypocrateriformis; tubus elongatus, teres,

Fitch del et lith.

prel: lith: Linn: imp.

Myosotis capitata. Hook. fil.

Fitch. del. et lith.

prel: lith: Linn: imp.

Myosotis antarctica. Hook. fil.

rectus, calyce sub ½ longior; limbus explanatus, lobis rotundatis, venosis, intense cyaneis, alabastris rubris; faux glandulis fornicatis, medio superne emarginatis fere clausa. *Stamina* 5, inclusa, apicibus solummodo antherarum exsertis, filamentis brevibus. *Nuculæ* 4, basifixæ, immaturæ late ovatæ, acutæ, plano compressæ, dorso convexiusculæ, intus medio obscure carinatæ, marginibus acutis, sub-ancipitibus; pericarpium subcrustaceum, tenue, fuscum. *Stylus* elongatus, gracilis, stigmate clavato, obtuso, exserto terminatus.

This is a very pretty species, though not quite so handsome as its near congener, *M. alpestris*, Schm., from which it differs at first sight in the smaller corollas, which are of a deep violet-blue, as in *M. Azorica*, H. Wats. It may I think be distinguished from any of the species of this difficult genus by the dense capitate racemes, together with the narrow calyces and calycine segments and the long tube of the corolla. Another allied species, the *M. fulva*, Hook. and Arn., which inhabits the west coasts both of extratropical North and South America, chiefly differs from this in the shorter tube of the white corolla, and in the calyces being densely covered with silky fulvous or pale brown hairs.

PLATE XXXVII. *Fig.* 1, a flower; *fig.* 2, corolla laid open; *fig.* 3, young achænia and style; *fig.* 4, dorsal, and *fig.* 5, anterior view of achænia nearly mature:—all *magnified.*

2. MYOSOTIS *antarctica*, Hook. fil.; parvula, cæspitosa, caulibus plurimis confertis prostratis v. ascendentibus foliosis, foliis obovato-oblongis subhispido-pilosis basi latis, floribus raris in axillis foliorum superiorum solitariis breviter pedicellatis, calycis segmentis lineari-subulatis obtusis, corollæ tubo calyce bis longiore limbo patente. (TAB. XXXVIII.)

HAB. Campbell's Island; on the débris at the base of precipices in the most exposed places along with *Cardamine stellata*, and in clefts of rock on the very summits of the mountains.

Radix perennis, brevis, subfusiformis, descendens, aterrima, multiceps, copiosissime fibrosa, fibris ramosis fasciculatis. *Caules* plurimi, abbreviati, 1 unc. longi vel breviores, undique patentes, subrigidi, parce ramosi, foliosi, interiores ascendentes, vetustiores prostrati, emortui anni præteriti longiores. *Folia* conferta, basi interdum imbricata, horizontaliter patentia, subcoriacea, obovato-oblonga, obtusa, inferiora et radicalia majora, vix ¾ unc. longa, 2–4 lin. lata, supra medium uninervia, subhispido-pilosa, pilis albidis appressis, subtus glabriuscula, pilis paucis, laxis, patentibus, versus basim latam glabra, marginibus ciliatis, vetustiora pilis sparsis, rigidis, basi globoso-incrassatis, demum deciduis obsita. *Flores* 4–6, parvi, inconspicui, vix racemosi, terminales solummodo in spicam nudam dispositi, 3–4 inferiores in axillis foliorum supremorum solitarii, subsessiles v. breviter pedicellati, plerumque inter folia occlusi. *Calyx* cylindraceus, segmentis corolla ½ brevioribus, ½ lin. longis, pilosis, pilis elongatis, fructiferis subfoliaceis. *Corollæ* tubus cylindraceus, elongatus, limbo explanato, lobis concavis, obovato-rotundatis, azureis, venosis. *Stamina* 5; filamentis brevibus, incurvis, subulatis; antheris majusculis. *Ovaria* 4, parva, sessilia. *Stylus* filiformis, stigmate simplice clavato terminatus. *Nuculæ* 4, unico v. pluribus abortivis, valde compressæ, ancipites v. subbialatæ, ovatæ, acutæ, dorso convexiusculæ, intus planiores, medio subcarinatæ. *Pericarpium* tenue, crustaceum, atrum, nitidum, læve. *Testa* membranacea. *Embryo* majusculus, compressus; radicula parva, supera; cotyledonibus majusculis, plano-convexis.

This is a very small species, typical of a high latitude and rigorous climate, preferring also those localities where few other plants but lichens and mosses can exist. It is remarkable as belonging to a small section of the genus, apparently confined to the islands of New Zealand, of which the *M. spathulata*, Forst., is the type. These have many of the lower flowers solitary in the axils of the uppermost leaves, and the true ebracteate raceme reduced to a very short and few-flowered spike.

The leaves of several of the New Zealand species of *Borragineæ* so closely resemble one another in form, that unless good flowering specimens are examined, two genera may easily be considered as belonging to one and the same plant. Such are a species of *Exarrhena*, Br., and the *M. spathulata* of A. Richard. The latter is a very distinct plant from either *M. capitata* or *M. antarctica*, as also from the true *spathulata* of Forster,

and has been described and figured (in Mus. Banks) as *M. rigida*, Banks and Sol. MSS. Forster accurately describes the flowers of his plant as solitary, most of them being truly so; but, from its being similar in all other respects to a plant brought home from New Zealand by Admiral D'Urville, except in the latter having the flowers in a raceme, M. Richard altered (in his Flora Novæ Zelandiæ, p. 198) the character of Forster. His species is probably the *M. rigida*, Banks and Solander, or another nearly allied plant which we possess from New Zealand.

The *M. antarctica* is certainly an extreme instance of any of the species having a leafy inflorescence; although the genus is generally described as having "racemus ebracteatus," there are some European and even British species, which, in having the lower flowers solitary in the axils of the uppermost leaves removed from the base of the raceme, show an evident analogy to the southern ones.

Several of the species of the northern hemisphere, though nearly identical with others of the southern, are not known to grow within 80 or 90 degrees of latitude of one another. This is the case both in the eastern and western hemispheres. A very few are inhabitants of the elevated and cold regions of the tropics, under the equator, where they attain, on the Andes of South America, an altitude of 12,000 feet. In the old world the present species represents the southern limit of the genus; especially as, from the elevation it attains in Campbell's Island, it may be supposed capable of existing at the level of the sea in a much higher southern latitude.

PLATE XXXVIII. *Fig.* 1, flower; *fig.* 2, corolla laid open; *fig.* 3, ovaria; *fig.* 4, stamen; *fig.* 5, calyx with ripe fruit; *fig.* 6, back, and *fig.* 7, front view of an achænium; *fig.* 8, transverse section of an achænium; *fig.* 9, embryo removed:—all *magnified*.

XXII. SCROPHULARINEÆ, *Juss.*

1. VERONICA, *L.*

1. VERONICA *elliptica*, Forst.; fruticosa v. arbuscula, ramulis obscure bifariam albo-puberulis, foliis decussatis horizontaliter patentibus ellipticis oblongis oblongo-lanceolatis v. obovato-oblongis acutis v. mucronatis rarius obtusis coriaceis glabris aveniis marginibus interdum ciliatis costa subtus prominula ultra apicem producta junioribus remote crenato-serratis, racemis axillaribus brevibus rarius corymboso-ramosis pauci-(4–10)-floris, calycis laciniis ovatis acutis v. acuminatis tubo corollæ paulo brevioribus, corolla majuscula alba v. carnea, capsulis late ovatis.—*Forst. Prodr.* n. 10. *et in A. Richard, Flor. Nov. Zel.* p. 189. *A. Cunn. Prodr. in Ann. Nat. Hist.* vol. i. p. 458. V. decussata, *Ait. Hort. Kew.* vol. i. p. 31. *Sims, Bot. Mag.* t. 242, *et auctorum.* V. decussata, *β, Banks and Sol. MSS.*

HAB. Lord Auckland's group and Campbell's Island; margins of woods near the sea, abundant.

This is a very well-known plant in our gardens, introduced from the Falkland Islands, and is one of the most antarctic trees, both in this longitude and in that of extreme Southern America, there reaching the 57th parallel of latitude. It was first collected in New Zealand by Forster, its original discoverer, in Dusky Bay, where it has since been found by Anderson and Menzies. I believe it however to have been noticed before as a native of the Straits of Magalhaens, by the older navigators.

In combining the *V. decussata* Ait. with *V. elliptica*, I have followed the unpublished opinion of Dr. Solander. In the British Museum there are drawings of the latter plant by Forster, New Zealand specimens collected probably by that author, and notes by Dr. Solander. The specimens alluded to are in fruit only, and agree in the foliage with the figures, which represent it in its flowering state. Dr. Forster's own handwriting

(of *V. elliptica*) is on the same sheet with it; but another plant, *V. Menziesii*, Benth. MSS., has been fastened down on the paper at a future period, and the habitat "New Zealand, Dusky Bay, Gul. Anderson," is written on the back, a station probably applying to the latter specimen alone. Solander's handwriting, of *V. decussata*, β, at the bottom of the sheet, applies to both, as in his manuscript he quotes both Forster and Anderson for the species. I am thus particular in alluding to the British Museum specimens, because there is a discrepancy between the plant of Forster as described by him, and our own, according to his MS. description, published by M. A. Richard, *l. c.*, where the tube of the corolla is described as being twice the length of the calycine segments, and the latter as subulate. In all our specimens, both from Lord Auckland and Campbell's Islands, as also in those of Antarctic America, the tube of the corolla is a little longer than the calyx, sometimes as much as one-third, but it appears even more so before the expansion of the corolla; and by subulate that author might have alluded to the acuminated apex which the segments sometimes have. Though Forster's drawing does not exhibit the calyx, it coincides too closely with the preserved specimen, and both with our plant, to leave any doubt in my mind that we have here another instance of the similarity of the vegetation of the higher latitudes. Dr. Solander indeed considers the New Zealand plant as a different variety from the Southern American, and in his MSS. description of the southern species, to which I have access through the kindness of Mr. Brown, he separates the former as "β. floribus carneis (Forster), ramis glabriusculis. Frutex sesquipedalis." In Forster's drawing the mineral white used to colour the flowers has become discoloured, and the pink alluded to by Dr. Solander almost obscured; in our specimens they are of a pure milk-white when fresh. The want of down on the branches arises from age.

In Lord Auckland's group this species attains a much larger size than it does in America, there seldom exceeding four feet in height, whilst Forster describes the Dusky Bay tree as twelve feet, and I have seen it as much as thirty on the margins of the woods close to the sea, where it may be readily distinguished by its pale green foliage and erect branches. I saw but one specimen in full flower, growing on an inaccessible rock overlooking Rendezvous Harbour; from a distance it seemed powdered with white flowers.

In New Zealand this genus is one of the most extensive of flowering plants, containing no less than twenty-five species, of which four-fifths are shrubby or arborescent. Of these, ten were originally discovered by Sir J. Banks and Dr. Solander during their visit to these islands, and are described in the MSS. above alluded to. Under one of them, the *V. macrocarpa*, Dr. Solander dwells upon that peculiarity in the structure of the fruit which separates many of them from the European forms of the genus: he writes, "Hæc, et quinque sequentes, (*V. salicifolia, myrtifolia, stricta, pubescens, parviflora,*) a reliquis *Veronicis* differunt, *corolla* subringente et *capsula* apice integra acutiuscula, ut fere proprium constituant genus." Mr. Brown (Prodr. p. 434) dwells more at length on this peculiarity, explaining the structure and its modifications, and further using it as a sectional character.

The extreme difficulty of determining the species of this section was also alluded to by Dr. Solander, who continues in the MSS. above quoted, "valde affines sunt, ut differentia specifica difficillime eruatur, præcipue si specimina sicca consulantur; nec illa sine capsulis distinguere possibile est. Plantæ autem vivæ habitu discrepant, facillimeque tunc dignoscuntur, ut alias species esse distinctas credam." This difficulty has not been a little increased by the accession of new species, similar to the above in form; and the whole genus is now so large as to require a complete remodelling; this is expected from the pen of Mr. Bentham, to whom I am indebted for the discrimination of my species. As his remarks bear reference to all the Auckland and Campbell's Island species, I shall avail myself of his kind permission to give the definition of the sections under which they will be arranged. "For this section," Mr. Bentham says, "I adopt as sectional Jussieu's name of *Hebe*, with the character: *capsula* septicido-bipartibilis, carpellis dorso breviter intus profunde bifidis. *Placentæ* stipitatæ. *Folia* crassiuscula, nitida, glaberrima, omnia opposita. *Racemi* axillares, v. ad apices ramorum corymbosi, v. paniculati. *Corollæ* tubus latitudine vix longior v. rarius brevissimus." Of this section there are five subsections, almost wholly composed of New Zealand species; under the second of these, this and the two follow-

ing will rank, thus characterized: "§ 2. *Decussatæ*. Frutices Antarcticæ v. Australasicæ. *Folia* crassiuscula, nitida, glaberrima, decussatim opposita, integerrima v. rarius subserrata, costa valida, venis inconspicuis. *Racemi* ad apices ramorum corymboso-congesti, v. rarius in axillis abbreviati, pauciflori. *Capsula* acuta v. obtusiuscula, turgida v. parallele compressa."—*Benth. MSS.*

2. VERONICA *Benthami*, Hook. fil.; fruticosa, ramulis junioribus bifariam puberulis demum glabris, foliis decussatis oblongis v. oblongo-obovatis v. lineari-oblongis obtusis basi angustatis sessilibus planis coriaceis uninerviis linea puberula alba marginatis integerrimis v. ultra medium remote serratis, racemis terminalibus, floribus inter bracteas foliaceas breviter pedicellatis, calycis laciniis 5 valde inæqualibus obtusis corollæ tubo multo longioribus, corolla 5-partita, capsula majuscula late ovata acuta. (TAB. XXXIX. & XL.)

HAB. Lord Auckland's group and Campbell's Island; on rocky places on the hills, abundant.

Frutex erectus, 2–4 pedalis, ramosus. *Caulis* brevis, validus, fuscus. *Rami* patentes, demum ascendentes, annulati, nudi, cortice fusco, opaco, longitudinaliter corrugato tecti. *Ramuli* erecti, validi, crassi, interdum crassitudine pennæ anserinæ, 5–7 unc. longi, obscure tetragoni, angulis obtusis, creberrime annulati v. potius transversim cicatricosi, basi nudi, sursum versus apices tantum foliosi, cortice pallide testaceo. *Folia* decussata, imbricata, horizontaliter patentia, inferiora majora, 1–1½ unc. longa, ¼–½ unc. lata, gradatim minora, sessilia v. in petiolum brevissimum attenuata, ima basi interdum connata, plana, forma varia, sæpius obovato-oblonga, nunc elliptica v. oblonga, rarius lineari-oblonga v. angustiora, obtusa, subacuta v. mucrone obtuso, basi semper attenuata, coriacea, integra v. supra medium remote crenato-serrata; margine tenuiter recurvo, linea latiuscula, alba, puberula, subargentea circumdato, versus apicem latiore et interdum plus minusve super paginam superiorem folii extensa, et tomento molli breve ciliata; supra intense viridia, subnitida, medio canaliculata, avenia; subtus pallidiora, subglaucescentia, costa medio prominula, valida; siccitate atro-fusca v. testacea, supra sæpius transversim corrugata. *Racemi* elongati, 1½–2½ unc. longi, terminales, erecti, validi, bracteis foliaceis tecti, sæpius simplices, interdum basin versus ramosi, ramis abbreviatis. *Rachis* tota albido-pubescens v. subtomentosa, teres, stricta; fructifera, demum elongata, basi nuda; anni præteriti persistens, lignosa, ramulo lateralis. *Bracteæ* foliaceæ, folia summa omnino simulantes, sed minores, inferiores ¾, supremæ ¼ unc. longæ, albido-marginatæ ut folia caulina, brevissime petiolatæ, petiolis basi distantibus, omnes floriferæ. *Flores* racemo singulo circiter 20–30, quorum 6–8 tantum simul explicant, in axillis bractearum solitarii, pedicellati, limbo corollæ exserto, conspicuo. *Pedicelli* ½–1 unc. longi, erecti, pubescentes; fructiferi elongati, validi, lignosi. *Calyx* profunde quinquepartitus, majusculus, campanulatus v. infundibuliformis, corollæ tubo multo longior, interdum limbum ejus æquans; laciniæ 2 exteriores laterales, cæteræ ½ longiores et bis latiores, obovato-spathulatæ, obtusæ, foliaceæ, sub 2 lin. longæ, albo marginatæ; cæteræ subæquales, lineari-spathulatæ, apicibus rotundatis paululum recurvis. *Corolla* hypocrateriformis, ampla, ringens v. patens, diametro 5–6 lin., intense azurea, venis violaceis; tubus limbo ⅓ brevior; laciniæ inter se æquales v. inæquales, plerumque 5, rarius 3 v. 6, nunquam 4 (mihi visæ), obovato-spathulatæ v. late obovatæ, forma variæ, nunc angustiores, nunc latiores. *Stamina* 2, rarius 3, fauce corollæ inserta; filamenta brevia, valida, subulata, laciniis sub ½ breviora; antheris majusculis, purpureis, loculis divaricatis. *Ovarium* late ovatum, subacutum, compressum, 2-sulcatum, 2-loculare, loculis pluriovulatis; ovulis marginibus inflexis dissepimentorum adnexis. *Stylus* validus, breviusculus, paulo curvatus. *Stigma* capitatum. *Capsulæ* in spicam v. racemum elongatum, erectum, nudum dispositæ, breviter v. longius pedicellatæ, pedicellis nunc 3–5 lin. longis, majusculæ, erectæ, paulo longiores quam latæ, 3–4 lin. longæ, coriaceæ, late ovatæ, acutæ, turgidæ, bi- tripartibiles, bi-, triloculares, septicide v. rarius loculicide bi- trivalves; valvulæ ovatæ, acutæ, pallide flavæ v. atræ, dorso ab apice ad medium et antice ad basim fissæ; placentæ pedicellatæ, ab utraque valvula discedentes, pedicellis gracilibus; rarius, et solummodo ubi capsula trilocularis sit, semina marginibus connatis dissepimentorum affixa sunt. *Semina* parva, imbricata, brunnea, compressa, ala lata,

Veronica Benthami Hook. fil.

coriacea, olivaceo-fusca, basi profunde emarginata circumdata. *Testa* membranacea. *Embryo* clavæformis, orthotropus.

This is not only a beautiful, but a very remarkable plant, and one of the greatest ornaments to the barren hills it inhabits, the flowers being nearly as large as those of *V. elliptica*, Forst., and of a most beautiful blue colour. In the pedicellate flowers, crowded upon an erect, leafy, terminal raceme, a few of which only expand at one time, it is more nearly allied to some of the British herbaceous species than to the shrubby group of New Zealand. It may also be remarked, that two of the largest-flowered species, whose corollas are of the finest blue, are more alpine in their habitats than most of their congeners, as is the case with this plant and with the *V. saxatilis* of the European Alps.

In garden specimens of the *V. speciosa*, R. Cunn. (Bot. Mag. t. 4057), I have observed the calyx and corolla to vary in the number of parts, from three to four, but I am not aware that the stamens in any species except the present ever exceed two, or that the corolla is constantly pentamerous. The *V. decussata*, Ait. (*elliptica*, Forst.) is figured and described in the 'Botanical Magazine' by Mr. Curtis (t. 242) as sometimes having five parts to the corolla, which is the nearest approach I know of to the present case. I shall however first point out the remarkable structure of the calyx, before more fully describing the corolla.

The calyx is constantly 5-cleft; the segments very large and singularly unequal in size, two being much larger than the rest, always external and of the form of cauline leaves; the other three are nearly equal, so that at first sight the calyx appears 3-cleft, with two lateral bracts on its base; the large segments are however remote from the true bract on the base of the pedicel. Neither of these is the posticous lobe, nor is the solitary smaller one placed between them, which is the lowest; but the two others, one of which is a little larger than the other, are nearly opposite the back lobe of the corolla.

The corolla is rather variable in form; when regularly developed it is 5-cleft, with rather broad, nearly equal, patent segments, the two lowest being the smallest, the upper the posticous. The segments are however often so very equal in size, that, from their appearance alone, it is not possible to judge which is the upper one. The increased number of parts might be supposed to arise from the division of the back lobe, which is in so many Veronicas the larger, and the stamens would thus be placed one at the outer base of two contiguous segments. This however is not the case in any 5-cleft flowers; when diandrous, only one segment separates them, which I have seen to be the upper when they are equal in size, and it is more evidently so when two of the lobes are smaller than the rest, which are then placed opposite the two stamens and are the lower. The additional lobe is formed thus from the division of the lower, or what is generally the smaller, lobe in others of the genus. Some analogy to this structure may be found in the case of *V. nivea*, nob. (Icon. Plant. t. 640), which has the lower lobe truly bifid, as I have proved by an examination of other specimens, and not accidentally, as suggested in the description of that plant on its first publication. In some spikes all the flowers are ringent, the tubes of the corollas longer, and the segments narrower than in the normal state of the plant. Of these some are 6-cleft, of which I found two instances, one diandrous and the other triandrous. In the diandrous flower the sixth lobe was formed from the division of the upper or posticous lobe into two unequal segments, and one of the stamens was abortive and inserted lower in the tube of the corolla than the other. In the triandrous specimen the sixth lobe was due to the splitting of the lower into three. We have here instances of both the upper and lower segment in this species becoming divided. I never saw any tendency in either of the lateral ones to divide, further, than that, in one instance of a 5-lobed corolla, one of these had a large tooth on its lower margin. Three-lobed corollas are rare; the two I examined were regular, with the segments nearly equal and very broad. The genus *Veronica* is generally described as having the upper or back lobe the largest; this is not constantly, though often the case, but the lower lobe is generally the smallest, sometimes remarkably so. In *V. nivea*, mentioned above, the lateral divisions are much the largest, as is the case with *V. Cataractæ*, Forst., and its ally *V. diffusa*, nob., very distinctly. The *V. tetragona*, Hook. (Icon. Plant. t. 580) is figured with the upper lobe bifid; it is probably rarely so, as in all the specimens I examined it was quite entire.

In the several instances of the flowers being triandrous, the stamens were all perfect; two in the usual position of those organs in *Veronica*, and the third opposite the upper segment, and hence in a position analogous to the centre of the lower lobe. I found no trace of abortive *stamina* in other parts of the corolla, or in the position of the third stamen in diandrous flowers.

The capsules vary much in size, from 2 lines to nearly $\frac{1}{3}$rd of an inch in length. Those with three valves were very large, and in one instance occupied the whole raceme; in other cases only a few of the capsules were 3-celled. In most instances, and always in the 2-valved, the valves separate from the central column which bears the placentæ and seeds, and the dehiscence is truly septicidal. In many of those with the additional valve, the capsule is only partially septicidal, one or more of the valves separating from the central column; whilst the inner margins of the dissepiments of the others are united from above the middle to the base, with the seeds attached to an inflexed portion and escaping at the top of the capsule, which is split no further down in front than at the back; in other cases all the contiguous dissepiments were thus united, and with the valves not separating at all, either from the axis or from one another, or with the axis itself dividing into three portions, which remain attached to the valves; in both the latter cases the capsules are spuriously loculicidal. I am not aware of this dehiscence occurring in any other of the New Zealand shrubby species of *Veronica*, or that a 3-valved capsule has been previously observed in the Natural Order *Scrophularineæ*.

Plate XXXIX & XL. *Fig.* 1, flower; *fig.* 2, calyx with an outer segment removed, showing the ovarium; *fig.* 3, a regular triandrous corolla; *fig.* 4, the same laid open; *fig.* 5, a diandrous corolla; *fig.* 6, a similar one with a lateral segment toothed; *fig.* 7, a 6-cleft corolla, the upper segment split and one stamen abortive; *fig.* 8, another 6-cleft corolla, triandrous, the lower segment divided into three; *fig.* 9, a 3-cleft corolla; *fig.* 10, a stamen; *fig.* 11, transverse section of an ovarium; *fig.* 12, back, and *fig.* 13, lateral view of a capsule; *fig.* 14, transverse section of do.; *fig.* 15, column and seeds; *fig.* 16, a 3-celled capsule; *fig.* 17, transverse section of do., with one valve free, the other partially united to the column; *fig.* 18, transverse section of another 3-valved capsule, with the central column divided into three parts and adhering to the valves; *fig.* 19, back view of a ripe seed; *fig.* 20, front view of another; *fig.* 21, lateral view of do.; *fig.* 22, embryo:—all *magnified*.

3. Veronica *odora*, Hook. fil.; fruticosa, glaberrima, ramis ramulisque erectis strictis virgatis, foliis decussatis uniformibus breviter petiolatis elliptico-ovatis submucronatis v. obtusiusculis concavis crassis rigidis marginibus tenuiter cartilagineis minute crenulatis, racemis brevibus ad apices ramulorum corymboso-confertis, calycis laciniis 4 obtusiusculis corollæ tubum æquantibus, corollæ laciniis majoribus oblongis tubo longioribus, staminibus corolla paulo brevioribus. (Tab. XLI.)

Hab. Lord Auckland's group; in woods near the sea, not uncommon, forming scattered bushes.

Frutex elegans, gracilis, 2–4 pedalis, parce fastigiatim ramosus. *Caulis* erectus, validus, nudus, semipedalis et ultra, planta juniore obscure tetragonus, cortice atro-fuseo. *Rami* elongati, erecti, stricti, virgati, superne foliosi, hic illic divisi, 2–3 pedes longi, cortice fusco, pallidiore obtecti. *Ramuli* graciles, crassitie fere pennæ anatinæ, subangulati, angulis obtusis, creberrime annulati, utrinque decussatim sulcati, in sulcis puberuli, per totam longitudinem foliosi, simplices v. rarius divisi v. ad apices floriferos furcati, olivaceo-fusci, siccitate fragiles. *Folia* decussatim opposita, $\frac{1}{2}$–$\frac{2}{3}$ unc. longa, sub $\frac{1}{4}$ unc. lata, omnia magnitudine formaque conformia, horizontaliter patentia, inferiora subreflexa, caduca, brevissime petiolata, concava, interdum subcymbiformia, exacte elliptico-ovata, subacuta, basi vix truncata, avenia, glaberrima, valde coriacea, subcornea, dura, marginibus acuentibus, tenuiter cartilagineis, sub lente argute et creberrime crenulatis, supra luride viridia, subnitida, polita, medio canaliculata; subtus pallidiora, costa valida, elevata, percursa, opaca, punctis minimis, albidis notata, siccitate fusco-brunnea, supra obscure transversim rugosa, rigida, subpungentia. *Petioli* breves, vix $\frac{1}{2}$ lin. longi, crassi, erecti, ramulo appressi, basi latissimi, cum ramulo incrassato articulati, facile soluti. *Flores* inter folia summa corymboso-racemosi, conferti, conspicui, odorem *Jasmini officinalis* spirantes. *Racemi* axil-

OF THE BOMBAY BRANCH OF THE ASIATIC SOCIETY

Fitch. del. et lith.

Veronica odora. Hook: fil.

lares et terminales, aggregati, subcapitati, densiflori, ½ unc. longi. *Pedunculi* (seu rachides) brevissimi, angulati, bifariam puberuli, articulati, siccitate fragiles, infra flores bracteolati. *Bracteæ* parvæ, sub ½ lin. longæ, basi subconnatæ, latissime ovatæ, concavæ, subcymbiformes, crassæ et coriaceæ, marginibus membranaceis, ciliatis. *Pedicelli* brevissimi, v. subnulli. *Calyx* profunde 4-partitus, v. subtetraphyllus, laciniæ inter se subæquales, bracteis æquilongæ, late ovato-oblongæ, obtusæ, tubum corollæ æquantes, medio et præcipue versus apices incrassatæ, 3-nerves; marginibus tenuioribus, sub lente ciliatis. *Corolla* alba, subrotata v. hypocrateriformis, tubo (pro genere) elongato, diametro 3–4 lin.; tubus paulo longior quam latus, rectus; limbus tubo longior, 4-fidus; laciniæ subæquales, patentes, subrecurvæ, oblongo-obovatæ, obtusæ, venosæ, superior paulo major, inferior angustior. *Stamina* 2; *filamenta* crassiuscula, subulata, laciniis corollæ paulo breviora, versus apices attenuata; *antheræ* purpureæ, majusculæ, loculis paulo divaricatis, superne confluentibus; hinc anthera subunilocularis, rima hypocrepiformi dehiscentes. *Pollen* ellipticum, profunde 3-sulcatum, luteum, siccitate castaneum, opacum. *Ovarium* ovatum, acutum, compressum, bisulcatum, biloculare. *Stylus* gracilis, paulo curvatus, exsertus. *Stigma* minutum, vix capitatum. *Fructus* non visus.

This species is more remarkable for the delicious fragrance of its flowers than for any beauty of appearance. From the uniform size of the leaves and their regularly patent disposition on the slender simple branches, it affords a more striking example of *folia decussata* than any of the genus. It is in this respect allied to the *V. elliptica*, Forst., as also in having crowded, white, subcapitate flowers, and in their being sweet-scented. Most of these characters, and especially that of the corolla being white, seem more usual amongst the alpine species of this genus in New Zealand, than in those of the lower lands of this or of other countries.

There are three other species to which this is allied; *V. diosmæfolia*, R. Cunn., *V. buxifolia*, Benth., and *V., lævis*, Benth. The first of these, which has also white flowers, may be recognized at once by these being in large lax panicles; they are small, on long, often slender peduncles, with acute calycine segments; the leaves also are longer and serrated. The *V. buxifolia* is a very fine alpine species, brought from the mountains of the interior by Dr. Dieffenbach, which differs from the *V. odora* in the leaves being more densely imbricated, shorter, shining on both sides, and remarkably truncate at the base above the petiole; it has also very short, often simple racemes, covered with large concave imbricating bracts, as in the *V. Benthami*, but closer; the tubes of the corolla are sometimes as long as the very broad segments,—that organ is thus truly hypocrateriform; the leaves are covered on both sides with more numerous minute white dots. *V. lævis*, Benth. is more nearly allied to our plant than any of the above in the form of the leaves, but they are more acute, more distantly placed, without any white dots; the panicles also are lax, minutely pubescent, the flowers smaller, and the branches singularly black and opake when dry, terete and wrinkled, with the transverse annuli or scars remote and inconspicuous, very unlike the generally crowded transverse contractions of its congeners, which often give the stem the appearance of being jointed.

The leaves are closely placed in *V. odora*, and each is jointed upon a thickening of the stem, which thickened portion appears like a broad petiole, united to the branch, and extending from the base of the true petiole to the leaf below, its edges almost meeting those of a similar thickening below the opposite leaf, but leaving a furrow between, which is covered with a fine pubescence. As this thickening occurs opposite and below each pair of leaves above it, and the furrow to the pair below, the stem is decussately furrowed throughout its length. In many, and in most species indeed, the stem is incrassated below the leaf, but the thickened portion has not, as here, the appearance of a distinct body.

PLATE XLI. *Fig.* 1, portion of the stem and pair of leaves; *fig.* 2, flower; *fig.* 3, calyx; *fig.* 4, corolla; *fig.* 5, the same cut open; *fig.* 6, front, and *fig.* 7, back view of stamen; *fig.* 8, ovarium :—all *magnified*.

XXIII. PLANTAGINEÆ, *Juss.*

1. PLANTAGO (Psyllium, *Endl.*) *Aucklandica*, Hook. fil.; acaulis, collo crassissimo elongato, foliis vix petiolatis numerosis confertis obovato-lanceolatis obtusis glabris 7–9-nerviis integerrimis v. obscure sinuato-dentatis, basi angustatis intus ferrugineo-tomentosis, scapis plurimis erectis v. ascendentibus parce hispido-pilosis, spicis lineari-elongatis densifloris, bracteis obtusis, segmentis calycinis late ovatis obtusis, capsulis calyce duplo longioribus 2-spermis. (TAB. XLII.)

HAB. Lord Auckland's group; on the mountain ridges at an altitude of 1000–1200 feet, in a peaty soil.

Planta 4–10-pollicaris, magnitudine satis varia, habitu *P. mediæ*. *Radix* perennis, perpendicularis v. inclinata, tri- quadri-pollicaris, fusiformis, crassa, per totam longitudinem fibras crassas, succulentas, elongatas emittens, et inferne in fibras ramosas, subsimiles desinens; *collum* crassissimum, interdum $\frac{3}{4}$ pollicis diametro, tomento rufo reliquiisque paucis foliorum vetustorum cinctum, rarius elongatum et supra terram elatum, simplex v. rarissime biceps. *Folia* numerosissima, singula planta 15–30, conferta, exteriora patentia, plurima suberecta, crassa et coriacea, exemplaribus plerisque 4–5-pollicaria, $2\frac{1}{2}$ unc. lata, inter se admodum conformia, obovato- v. elliptico-lanceolata, obtusa v. subacuta, in petiolum latum, ima basi dilatatum contracta, 7–10-nervia, vix costata, utrinque glaberrima, v. rarius pilis conspersis, paucis, albis subhispida, præcipue ad basim scaporum villoso-barbata, tomento molli, denso, ferrugineo, e pilis intertextis, simplicibus, remote articulatis formata; marginibus tenuiter subrecurvis v. planis, remote et obscure sinuato-dentatis; supra luride-viridia, opaca; subtus pallidiora; siccitate fusca, v. atro-fusca; interiora et juniora angustiora, subspathulata, 3–5-nervia; intimis lineari-lanceolatis. *Scapi* plurimi, 5–10, elongati, una-cum spica 5–8-pollicares, erecti v. ascendentes, curvati, graciles, teretes, pilis patentibus, albis, superne præcipue subhispidi, basi ferrugineo-tomentosi, crassitie pennæ corvinæ, siccitate atri. *Spicæ* 2–3 unc. longæ, $\frac{1}{3}$ unc. latæ, cylindricæ, obtusæ, superne præcipue densifloræ, floribus basi distantibus; rachi pilosa. *Flores* magnitudine *P. majoris*, omnino sessiles, unibracteati. *Bracteæ* late ovatæ, obtusæ, concavæ, subcymbiformes, crassæ et carnosæ, calyce paulo breviores, basin ejus fere cingens. *Calyx* tetraphyllus, basi villosus, $\frac{3}{4}$ lin. longus; segmentis late ovato-oblongis, suborbicularibus, scaphiformibus, medio carnosis, marginibus membranaceis, siccitate scariosis. *Corollæ* tubus calyce paulo longior; limbi segmentis ovato-lanceolatis, acutis, patenti-reflexis, marginibus involutis, medio late uninerviis, tubo paulo brevioribus. *Stamina* filamentis planis, flexuosis, longe exsertis; antheris majusculis, late sagittatis. *Pollen* angulatum, flavum. *Ovarium* obovatum, compressum, utrinque sulcatum basi attenuatum, spurie biloculare; columna centralis placentifera a dissepimentis retractis discedens, ovula 2, peltata gerens. *Capsula* turgida, ovata, foliolis calycinis bis longior.

This species is very distinct from any with which I am acquainted, and is apparently most nearly allied to the *P. hirtella*, H.B.K. (Nov. Gen. et Sp. t. 127), but that plant has the bracteæ and calycine segments acute; it grows nowhere on the low grounds of Lord Auckland's group, but appears confined to the summits of the hills, where it is not unfrequent. It is remarkable for its numerous leaves, which are generally quite smooth and very fleshy, often forming a dense head, not unlike that of a small cabbage. In the smoothness, thick and succulent habit and stout collum, it bears some affinity to the caulescent species of Juan Fernandez and other insular situations; in some of which the apparent stems are, as in *P. Fernandeziana*, Bert., in reality an elongation of the naked collum: indeed of the so-called shrubby or caulescent species, very few of this group or form are really so, except the *P. princeps*, Cham. and Schl. (Linnæa, vol. i. p. 167). The stem of *P. Queleniana*, Gaud., is of the same nature as that of *P. Fernandeziana*, the two plants indeed are very closely allied, as are those of *P. arborescens* of Madeira and the Canary Islands, and of *P. robusta* of St. Helena.

The uniform and equable climate of insular situations, especially in the southern hemisphere, would appear

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Fitch. del. et lith.

prel. lith. Lann imp.

Plantago Aucklandica. Hook. fil.

BR... OF THE ... ASIATIC ...

Fitch. del. et lith.

prel: lith: Linn: imp.

Plantago carnosa. Br.

peculiarly favourable to a vigorous development of the stem and leaves of plants; there being no winter's cold sufficient to destroy even the herbaceous vegetation, a constant accession of new matter ensues in the summer, which only decays with the death of the plant. The elongation of the collum is, under these circumstances, very frequent amongst many truly herbaceous, perennial-rooted plants, whose congeners in other climates are cut off during the winter's frosts, close to the ground, and where the summer season is too dry to admit of much exposure of so large a portion of the root. In the group of islands now under consideration, I have remarked this peculiarity of structure in *Ranunculus, Cardamine, Sieversia, Pozoa,* both species of *Pleurophyllum, Celmisia, Gentiana,* and others. In Kerguelen's Land a remarkable instance occurs in the famous Cabbage of that island, a new genus and species of *Cruciferæ,* to which the generic name of *Pringlea* was given by its discoverer Mr. Anderson, and which I shall shortly have the opportunity of figuring as *P. antiscorbutica.* In the southern extreme of America the *P. monanthos,* D'Urv., assumes this spuriously caulescent form, as well as *Statice* and many other herbaceous genera, and in the various small oceanic islands the same character prevails. As a natural sequence, it is to be expected that plants generally represented by small suffruticose species, should under these circumstances become frutescent or arborescent, of which we have many instances. *Veronicæ, Compositæ, Araliaceæ, Myrtaceæ, Rubiaceæ, Campanulaceæ, Lobeliaceæ,* and Ferns, are all more fully developed in the Pacific islands in proportion to the number of smaller species, and to the mass of the vegetation, than they are in other climates.

PLATE XLII. *Fig.* 1, flower and bractea; *fig.* 2, corolla; *fig.* 3, the same cut open; *fig.* 4, anther and upper part of filament; *fig.* 5, ovarium; *fig.* 6, young capsule; *fig.* 7, transverse section of the same; *fig.* 8, immature seeds on the column; *fig.* 9, capsule surrounded by remains of corolla, calyx and bractea; *fig.* 10, hair from the bases of the leaves:—all *magnified.*

2. PLANTAGO (Arnoglossum, *Endl.*) *carnosa,* Br.; acaulis, collo crassissimo, foliis plurimis confertis stellatim patentibus crassis carnosis spathulatis lanceolatisve obtusis inciso-dentatis seu runcinatis glaberrimis aut rarius pilosis basi nudis, scapis plurimis foliis æquilongis, floribus capitatis, capitulis compressis 1–4-floris, bracteis foliolisque calycinis acutis, capsula calyce inclusa rotundata 4–8-sperma. (TAB. XLIII.)—P. carnosa, *Br. Prodr.* p. 425 (*non Lam.*). P. triantha, *Spreng. Syst. Veg.* vol. i. p. 439.

Var. β. foliis glaberrimis majoribus.

Var. γ. pumila, foliis plus minusve hispido-pilosis.

HAB. Lord Auckland's group; on rocks near the sea, generally immediately above high-water mark, all the states; abundant.

Planta maritima, depressa, succulenta, rupibus tenaciter affixa. *Radix* perennis, breviter fusiformis, copiosissime fibrosa; fibris aterrimis, plerisque tenuibus, fastigiatis, aliis validis, crassis, subsucculentis. *Collum* crassissimum, breve, nigrum, simplex v. rarius biceps, nudum, fibrosum, non raro surculos emittens. *Folia* petiolata, ½–3 unc. longa, horizontaliter stellatim patentia, conferta, numerosissima, singula planta 40–60, succulenta, lanceolata, spathulata, v. lineari-spathulata, obtusa, basi attenuata, margine varie secta, sinuato-dentata, inciso-dentata v. sæpius runcinata, rarius utrinque uni-bidentata v. omnino integra; supra luride virescentia, opaca, medio sulcata, avenia; subtus pallidiora, costa medio prominula, nervisque 2 per totam longitudinem percursa; glaberrima v. in var. β. pilis patentibus v. appressis, sparsis, rigidis, albis subhispida; intima breviora, dense compacta, rosulata, obovata, margine sinuata. *Scapi* valde numerosi, 15–20, horizontaliter patentes, apicibus ascendentibus, ex axillis foliorum orti, longitudine foliorum v. iis breviores, interdum brevissimi, glabri v. plerumque pilosi, pilis patentibus ut in foliis. *Spica* ad capitulam late ovatam, superne truncatam redacta, valde compressa, ¼ unc. lata, latior quam longa, pauci–2–4-flora. *Bracteæ* majusculæ, ovatæ, cymbiformes, subacutæ v. acuminatæ, carnosæ, marginibus membranaceis, basin calycis fere cingentes. *Calyx* tetraphyllus, foliolis late

oblongo-ovatis, valde concavis, acutis v. subito acuminatis, medio carnosis, marginibus late subscarioso-membranaceis. *Corollæ* tubus latiusculus; limbus quadrifidus, segmentis ovatis, acutis, marginibus involutis, medio late uninerviis. *Staminum filamenta* basi lata; *antheræ* oblongo-sagittatæ. *Pollen* globosum, flavum. *Ovarium* parvum, elliptico-ovatum, compressum, utrinque sulcatum, spurie biloculare; ovulis 6–8, peltatis, placentæ columnari affixis. *Stylus* simplex, erectus, filiformis, per totam longitudinem glanduloso-pilosus, apice simplex. *Capsula* chartacea, brunnea, late obovata, turgida, paulo compressa, basi stylo apiculata, infra medium circumscissa. *Columna centralis* libera, erecta, clavata, bialata, alis ultra columnam in cornubus 2 productis. *Semina* valde depressa, 6–8, etsi compressione mutua angulata, pleraque triangularia, pallide testacea, translucida; *testa* mucilaginosa, membranacea; *albumen* inter corneum et carnosum, semini conforme; *embryo* compressus, ut mihi videtur oblique transversus; *radicula* obtusa, ad hilum paulo versa; *cotyledones* majusculæ, plano-convexæ.

This plant was first detected by Mr. Brown in Tasmania, in the southern parts of which island it is not uncommon, growing, as in Lord Auckland's group, on maritime rocks, and from whence we have specimens of both varieties from Mr. Gunn. In habit and foliage it most resembles the *P. Coronopus* of any European species, but it differs totally from that plant in the structure of the capsule, as also in the inflorescence. It belongs to a small group of the genus, not hitherto recognised, but which are remarkable for having the flowers solitary or truly capitate and not spiked, never more than from three to five in number. This inflorescence differs very much from that of several species in which the spike is abbreviated, either naturally or by accident, to a few flowers.

The species naturally allied to *P. carnosa* are the *P. rigida* and *nubigena*, H. B. K., *P. monanthos*, D'Urv., *P. andicola*, Gill., *P. pauciflora*, Lam., and *P. barbata*, Forst., all natives of the southern regions of the globe and of the western hemisphere, whose only representative in the old world is the present plant. If however the sections proposed by Endlicher are adopted, these species will be found to be in several cases widely separated from one another. *P. nubigena*, a very beautiful species, has only two-seeded capsules; the seeds are quite unlike those of *carnosa*, being large, elliptical-oblong, black and punctated, with a broad hollow on the face. Of *P. rigida* we have specimens gathered by Mr. Mathews on the Pampas of the Cordillera in Peru; it is perhaps the most singular species of the genus in the structure of its flowers, which are solitary, almost sessile, on very short peduncles, surrounded by a very broad sheath or spatha rather than bract at the base; the calycine segments are lanceolate, acuminate, with a tuft of silky hairs at the base; the tube of the corolla is twice as long as the calyx, slender, and at least three times longer in proportion to its breadth than in any of the genus which I have examined; the filaments very long, straight and erect. M. Kunth places it in a section "capsulæ loculis 1-spermis," but says he has not seen the fruit. From the small size of the ovarium I could not detect the ovules in the flower I examined. *P. monanthos*, though generally single-flowered, has often two or even three flowers; the capsule is four-seeded; it is a very distinct species, common in the Falkland Islands and in Fuegia, singularly variable in size, and in favourable situations often becoming spuriously caulescent, with stems similar to those of the *P. arborescens* of Madeira; the leaves are then two inches long; whilst in other situations, as on the exposed rocks of Cape Horn, the whole plant resembles a densely tufted moss, the leaves being rosulate and not two lines long. Had I not the opportunity of examining it in its native state, I should not have considered several of its varieties as belonging to one and the same species. *P. andicola*, Gill., is a very singular plant with roots as thick and long as the little finger, the *collum* often much thicker, bearing two or more capitula of very coriaceous, lanceolate, smooth or pilose leaves, about 1½ inch long. The scapes are longer, often twice as long as the leaves, slender and hairy, with three to five flowers. The *ovarium* contains several ovules, and the capsule four or more seeds, rarely less, but sometimes only two. It has been gathered on the Andes of Chili, both by Dr. Gillies and by Mr. Bridges. *P. pauciflora*, Lam., and *P. barbata*, Forst., seem involved in some confusion; I have seen no specimens answering to the description of either, if they be truly distinct. In Mr. Anderson's collection, formed during Captain King's voyage, there is a species (*P. imberbis*, MSS.) agreeing with

the description given by Lamarck, except that the whole plant is perfectly glabrous; it also is four-seeded, and the flowers vary from one to three. These species pass into other forms of the genus: the *P. monanthos*, by *P. arborescens*, into the ovate and compressed spike of *P. Psyllium* and its allies; and the *P. nubigena* through *P. tumida*, Link, into the ordinary forms with cylindrical elongated spikes.

Plantago is perhaps as universally distributed a genus as any of dicotyledonous plants. In Arctic America Dr. Richardson has gathered the *P. major*, L., in lat. 68° N., and I have seen the *P. monanthos*, D'Urv., in the immediate neighbourhood of Cape Horn, in the 57th degree of south latitude: other species not only run along the whole chain of the Andes, from Fuegia through Chili, Peru and Colombia, from whence they are continued along the Rocky mountains, but they also frequent the vast plains on both sides of these great barriers. Under the equator in South America they attain an altitude of 13,000 feet, whence Prof. Jameson has sent to us a species, gathered on Pichincha in Colombia. In the continent of Europe they are no less universally distributed, *P. major*, which Mr. Humboldt brought from a height of 6000 feet on the Andes of Peru, occurring in Lapland as far north as 67°, whilst in the same country the *P. maritima* reaches the 72nd degree. In Asia their principal parallel is in Persia, Cashmere and Affghanistan, where Mr. Griffiths has collected numerous species, and from whence they spread over the great Siberian plains to Kamtschatka and the borders of the Chinese empire. A few species are natives of Upper India, Nepaul, and the Himalayah mountains. Only one occurs in the Peninsula of India, the *P. Uspaghool*, Roxb.; this is cultivated in the colder season, and Dr. Royle considers it as probably a native of Persia. Hitherto they are unknown in the Malay peninsula and islands, being natives of open and not wooded localities. For this reason they are not found, as far as we know, in central Africa, though several species are natives of the Cape of Good Hope, and are frequent along the southern shores of the Mediterranean. The various Atlantic islands, as well as the Mauritius and Ceylon in the Indian Ocean, and those of the Pacific, Australia and New Zealand, have all representatives of the genus.

I have retained Mr. Brown's name for this species, the *P. carnosa* of Lamarck being probably a variety of *P. maritima*, L.

PLATE XLIII. *Fig.* 1, flower and bract; *fig.* 2, corolla cut open; *fig.* 3, stamen; *fig.* 4, ovarium; *fig.* 5, capsule with persistent calyx and bract; *fig.* 6, the same removed; *fig.* 7, the same with the upper valve fallen away; *fig.* 8, side view of dissepiments and seeds; *fig.* 9, front view of the same; *fig.* 10, seed showing the hilum; *fig.* 11, side view of the same; *fig.* 12, seed cut open parallel to, and *fig.* 13, at right angles to the axis:—all *magnified*.

XXIV. POLYGONEÆ, *Juss.*

1. RUMEX *cuneifolius*, Campd., *Mon. des Rum.* p. 95. *Cham. et Schlecht. in Linnæa*, vol. iii. p. 58. *Roem. et Schult.* vol. vii. p. 1416.

Var. *alismæfolius*, Hook. fil.; foliis ovato- v. lineari-oblongis rarius basi attenuatis:—*an* species *distincta*?

HAB. Lord Auckland's group; on the sandy and pebbly beach near the N.W. point of the large island, rare.

Of this plant I have seen neither flower nor fruit, having met with it in a very young state only. In habit, size, and general appearance it very closely resembles the *R. cuneifolius*. It has the large membranous stipules of that plant, which are fimbriated only in age; the branching and size of the two are also the same; but in the Auckland Island specimens the leaves are not decidedly cuneate at the base, often indeed quite the contrary. Of the true plant we have many specimens from both sides of America, from the southward of the province of St. Paul on the east coast, and Valdivia on the west, to the Straits of Magalhaens. They vary but slightly in the form and length of the leaf, some being attenuated, others cordate at the base; always, in the American specimens, broadest above the middle, and crisped rather than undulated at the margin.

XXV. URTICEÆ, *Juss.*

1. URTICA *australis*, Hook. fil.; caule elato basi prostrato radicante valido glaberrimo v. parce piloso ad nodos setoso, foliis amplis longe petiolatis ternatis infimis oppositis late ovato-cordatis grosse crenatis sinubus segmentisque acutis 5–7-nerviis utrinque parce setosis et sub lente scabriusculis subtus pilosiusculis, stipulis ovato-lanceolatis acuminatis integris v. bifidis.

HAB. Lord Auckland's group; in woods near the sea, rare; also on the pebbly beach above high-water mark.

Caulis basi repens, remote nodosus, ad nodos radicans, deinde ascendens et erectus, 2–3 pedalis, teres, crassus, crassitie pennæ olorinæ, herbaceus, succulentus, glaberrimus v. hic illic parce pilosus, pilis albidis, plerumque ad nodos subincrassatos setosus, internodiis 3–4 uncialibus. *Folia* longe petiolata, infima opposita, superiora ternata, carnosiuscula, siccitate submembranacea, majuscula, 4–6 unc. longa, 3–5 lata, late ovata, acuta, basi plus minusve profunde cordata, grosse serrato-dentata, segmentis latis, acutis v. rarius breviter acuminatis, sæpius cucullata, nervis 5–7 validis percursa, tuberculis minutis scaberula, setis paucis, sparsis, subtus pilosiuscula, pilis obscuris albis. *Petioli* folio æquilongi v. paulo breviores, graciles, glaberrimi. *Stipulæ* ad basin petioli 2, $\frac{1}{2}$–$\frac{3}{4}$ unc. longæ, foliaceæ, erectæ, lanceolatæ, acuminatæ, glaberrimæ, interdum foliorum oppositorum connatæ, tunc latiores et plus minusve profunde bifidæ.

Planta maritima paulo diversa; humilior, crassior, foliis minoribus petiolis superne stipulisque majoribus setosis. Plantis junioribus folia inferiora latiora evadunt, argutius serrato-dentata.

I find no species in the Herbarium exactly agreeing with this; it is however nearly allied to a New Zealand plant of which we have very imperfect specimens collected in the southern part of the Northern Island by Mr. Bidwill, with the petioles rather shorter and the leaves and stem copiously setose.

2. URTICA *Aucklandica*, Hook. fil.; tota pubescens, caule erecto robusto angulato, foliis omnibus oppositis petiolatis late ovatis acutis basi plus minusve cordatis grosse serrato-dentatis segmentis acuminatis multinerviis rugosis sparse setosis coriaceis, petiolo lamina $\frac{1}{3}$ breviore, stipulis subfoliaceis plerisque connatis late ovatis bifidis nervosis, perigonio masc. tetraphyllo.

HAB. Lord Auckland's group; on the sea-beach near the margins of woods, rare.

Herba rigida, tota pilis brevibus, cinereo-albidis pubescens. *Caulis* erectus, validus, durus, rigidus, pedalis, crassitie pennæ anserinæ, tetragonus, angulis obtusis, ad nodos incrassatus et setosus; internodiis contractis, subuncialibus, sulcatis. *Folia* opposita, patentia, petiolata, majuscula, 2–3 uncias longa, $1\frac{1}{2}$–$2\frac{1}{2}$ lata, late ovata, acuta, basi sæpius cordata, interdum imo rotundata, cucullata, grosse serrato-dentata, sinubus acutis, segmentis latis breviter acuminatis, coriacea et rigida, rugosa, subplicata, pluri-7–9-nervia, nervis subtus prominulis costata, reticulata, sparse et præcipue subtus ad nervos setosa, setis urentibus, luride virescentia, opaca; siccitate nigrescentia; juniora fusco-pubescentia. *Petioli* subunciales, validi, sulcati. *Stipulæ* majusculæ, foliaceæ, late ovatæ, bifidæ, bipartitæ v. rarius usque ad basin fissæ, et tunc lanceolatæ, acuminatæ. *Spicæ masculæ* axillares, breviusculæ; immaturæ tantum mihi visæ. *Flores* aggregati, pedicellati; *pedicellis* basi bracteolatis; *bracteola* ovata integra. *Perigonii foliola* rotundata, concava, $\frac{1}{4}$ lin. longa, dorso setosa. *Stamina* 4, filamentis brevibus.

This is unlike any species with which I am acquainted, and apparently quite distinct from the last, though I much regret having been unable, from the early season of the year, to obtain more satisfactory specimens of both.

XXVI. ORCHIDEÆ, *Juss.*

1. CHILOGLOTTIS *cornuta*, Hook. fil.; perianthio ringente, foliolis inferioribus linearibus obtusis canaliculatis, interioribus erectis ovato-lanceolatis acutis dorsali ovato-lanceolato acuminato, labello trulliformi versus apicem attenuato disco 6-glanduloso, glandula intermedia basali (appendix labelli) porrecta subrecurva.

HAB. Campbell's Island; on the decaying roots of trees in shaded places, rare: *D. Lyall, Esq.*

Radix tuberosa; tuberibus 2, pisiformibus, remotis, caudice elongato, radiciformi, descendente connexis. *Folia* 2, petiolata, patentia v. subrecurva, ovata, v. ovato-lanceolata, subacuta, 1–1½ unc. longa, ⅓–½ unc. lata, nervis parallelis, venisque transversalibus reticulata, planiuscula. *Petioli* erecti, ½–¾ unc. longi, basi vaginantes, vagina scariosa, integra. *Scapus* erectus, gracilis, brevis, ½ uncialis, medio bracteatus, uniflorus. *Bractea* spathacea, ovata, acuminata, membranacea, florem immaturum amplectens. *Flos* una cum ovario ¾ unc. longus, erectus. *Perianthium* obliquum, foliola omnia erecta; exteriora v. sepala subæqualia, *superius* v. *dorsale* paulo majus, concavum, vix cucullatum, ovato-lanceolatum, longe acuminatum, apice subulatum, sub 5-nerve; *inferiora* labello supposita, ima basi lata, deinde linearia, obtusa, curvata, marginibus involutis, superiore æquilonga; *foliola interiora* sive petala erecta, ovato-lanceolata; exteriora breviora, submembranacea, trinervia, versus apices subserrulata v. undulata. *Labellum* erectum, unguiculatum, petalis paulo brevius; lamina planiuscula trulliformis, vel triangulari-cordata, attenuata, basi truncato-biloba, breviter petiolata, disco 6-glanduloso; *glandulæ* v. tubercula valde prominentes, 4 laterales subquadratæ, compressæ, squamæformes, duæ prope basin, aliæque altius sitæ; intermediarum basali (v. appendicula) supra discum elata, porrecta, cornu referens, et recurva, antice canaliculata; quinta trilobata. *Columna* erecta, modice arcuata, valida, superne bifida, bialata, alis angustis. *Anthera* apice recurva.

An glandulæ laterales labelli vere clavatæ, siccitate tantum compressæ et quasi squamæformes?

This is a very interesting plant, belonging to an Australian genus of which only two species were previously known. I have never seen it alive, and am therefore unable to give a coloured figure of the plant. In Tasmania two species grow at the foot of Mount Wellington, in a latitude however much below that of Campbell's Island and in a widely different climate. The flower is smaller than that of *C. Gunnii*, Lindl., to which, of the two other species, the present is, on account of the erect petals, most nearly allied. I am inclined to think that the glands on the disc of the labellum will be found to prove a variable character. In one Tasmanian species they bear the most striking resemblance in form and colour to an ant.

2. THELYMITRA *stenopetala*, Hook. fil.; foliis petiolatis lineari-lanceolatis gradatim acuminatis, scapo 1–2-floro, perianthii foliolis lanceolatis acuminatis, cuculli lobulis lateralibus plumosis, capsulis inclinatis paulo curvatis lineari-oblongis.

HAB. Lord Auckland's group; in woods and on the bare ground in exposed places, not uncommon.

The leaves of this plant are dark green, very coriaceous, about 4 inches long and 3–4 lines in breadth, gradually attenuated below into a narrow sheathing petiole. The scapes of the former year, bearing the fruit and crowned with the withered, persistent perianth, were found along with the young leaves. The capsules are shortly pedunculate, pale brown, ½–¾ of an inch long; the column considerably curved, the lateral lobes each with a tuft of hairs.

I have closely compared my very indifferent specimens of this plant with the several species of New Zealand and Tasmania, and have no hesitation in describing it as new.

3. THELYMITRA ? *uniflora*, Hook. fil.; perianthii foliolis exterioribus ovato-oblongis acutis, interioribus obovato-lanceolatis breviter acuminatis, labello late obovato-spathulato subcuneato basi depresso, cuculli lobulis lateralibus erectis apice bifidis medio uninerviis imberbibus, anthera subterminali.

HAB. Lord Auckland's group; on the bare ground and growing in tufts of moss, *Forstera*, &c., on the bleak hills.

Of this species I possess only the old scapes, which are about six inches long, each bearing a solitary capsule, with the withered perianth. The leaves I have never seen, but there are traces of sheaths or leaves on the scape, and of a larger one, probably a *bractea*, below the flower. The capsule is turgid, elliptical-obovate, erect, about half an inch long and quite glabrous. The leaflets of the perianth are rather shorter than the capsule and strongly nerved, as is the *labellum*, which is rounded at the lower extremity, with a short apiculus. The anther is inserted a little below the apex of the column.

I am very uncertain as to the genus of this plant; it differs from any with which I am acquainted; yet I am unwilling, in the absence of better specimens, to constitute a new one of it. In the petaloid, very distinct lateral lobes of the column, which is 3-cleft nearly to the base, it shows some analogy to *Diuris*, and in the terminal anther to the group which includes *Caladenia* and many other New Holland *Orchideæ*. The regular and nearly equal leaflets of the perianth, to which the labellum is very similar in form and structure, induce me to retain it among *Thelymitræ*. It is further undoubtedly nearly allied to a plant included by Mr. Gunn under the genus *Macdonaldia* (vid. Lindl. Swan River Botany, p. 50. no. 217, and Gen. and Sp. Orchid. p. 385), which contains two Tasmanian species, one *M. Smithiana*, Lindl. (*l. c.* t. 9. B.), in which the column is undivided or obliquely trifid or three-lobed; the rounded anther is situated below the apex of the column, on its inner face, and is villous; in the colour and appearance also of the plant, and in the shape of the leaflets of the perianth, it differs from *Thelymitra*. The other species, *M. cyanea*, Lindl., very much resembles the more ordinary forms of *Thelymitra* in size, habit, colour, and in the shape of the perianth; in the more terminal acute anther, and in the lateral lobes of the column being produced upwards beyond the anther and bifid at the apex, it agrees with the *T.* ? *uniflora*.

4. CALADENIA sp. ?; folio lineari acuto parce glanduloso-piloso, perianthii foliolis subæquilongis dorsali late ovato acuto lateralibus ovato-lanceolatis interioribus lanceolatis subacutis, labello subquadrato unguiculato disco nudo.

HAB. Lord Auckland's group; amongst moss in the woods near the sea.

This apparently belongs to the genus *Caladenia*, but it is in a very young state, and the glands on the labellum are probably undeveloped. The roots are small, oblong tubers, connected by a terete *cauliculus*. Leaves ½–2 inches long. The only flowers I possess are just emerging from a large cucullate *bractea*; they are of a pale flesh-colour mixed with yellow.

5. CALADENIA sp.?; foliis ovato-lanceolatis acutis parce piloso-glandulosis seu glabriusculis, perianthii foliolis exterioribus extus glandulosis lateralibus linearibus obtusis dorsali latiore, interioribus anguste linearibus obtusis, labello obovato-cuneato basi seriebus 2 glandularum ornato.

HAB. Lord Auckland's group and Campbell's Island; amongst moss in the woods, not uncommon.

What I take to be the leaves of this plant (for though growing along with the scapes they were not attached to them) are solitary or rarely two together, arising from a short *cauliculus* terminating in an elongated tuber and throwing out stout horizontal fibres from its lower extremity. The withered scapes, which

bear solitary capsules, are 2–3 inches long; the capsules half an inch long, oblong-turbinate, obscurely glandular, and crowned with the reflexed leaflets of the perianth. In one specimen the *labellum* was furnished with only four glands in two lines; in another they extended to the middle with four or six in each series.

6. ACIANTHUS *rivularis* ? A. Cunningham, *Prodr. Flor. Nov. Zel. in Hook. Comp. Bot. Mag.* vol. ii. p. 376. *Lindl. Gen. et Sp. Orchid.* p. 397.

HAB. Lord Auckland's group and Campbell's Island; on mossy banks in the woods, common.

I have seen neither flower nor fruit of this plant, and only a withered capsule of what I believe to be Mr. Cunningham's *A. rivularis*, gathered in New Zealand by Mr. Colenso. The leaves of the former vary very much in size and shape according to their age; the younger ones are cordate or ovate and cordate at the base, acute; as they grow older they become orbicular, deeply lobed at the petiole, of the same size and texture and similarly nerved as in the genus *Acianthus*.

Dubii generis.

The following species I am unable to refer to any genus, the flowers being too imperfectly developed for a satisfactory determination.

7. Tuberibus didymis obovatis ad collum fibras validas horizontaliter emittentibus, caule erecto basi vaginato, vagina elongata integra ore abrupta tenuissime scariosa, folio solitario lineari-elongato semiterete superne canaliculato crasso et subcarnoso basi fisso scapum vaginante, scapo 3–5-floro, floribus spathaceo-bracteatis ut in *Orthocerate*, perianthii foliolis valde immaturis subæqualibus exterioribus late ovatis acutis, interioribus paulo angustioribus, labello late obovato nudo, columna semiterete lobis lateralibus nullis, anthera majuscula terminali.

HAB. Lord Auckland's group; in woods near the sea, not uncommon.

Tubers about 3 lines long, similar to those of *Orchis latifolia*, but much smaller; from these the leaf springs at once, its petiole surrounded by a tubular cylindrical sheath. The leaf is 6–8 inches long, 1–2 lines wide, acute or blunt at the apex, green, and of a singularly thick and fleshy texture when recent, coriaceous when dry and quite black. The young scape is covered with what appear sheathing cucullate bracts; they arise one from the base of each of the flowers; the latter are very small.

8. Foliis solitariis (rarius binis) lineari-lanceolatis acutis valde concavis coriaceis nervis parallelis basi vaginatis, scapo aut videtur bibracteolato, flore immaturo solitario, perianthii foliolo dorsali late ovato subacuto cucullato lateralibus interioribusque linearibus obtusis, labello ovato disco obscure 6–7-glanduloso, anthera terminali.

HAB. Lord Auckland's group; in woods, rare.

The leaves here are 2–3 inches long, very concave; the petiole inclosed in a long scarious sheath which is split above; the flower is small and inclosed in two sheathing bracts. This plant has some points in common with *Chiloglottis*, Br., but the leaves are not like those of that genus.

XXVII. ASPHODELEÆ, *Juss.*

1. CHRYSOBACTRON, *Hook. fil.*

Dioicum. *Flores* racemosi. Masc. *Perianthium* corollinum, hexaphyllum; *foliola* patentia, æqualia, ovato-oblonga, obtusa, medio incrassata. *Stamina* 6, hypogyna; *filamenta* elongato-subulata, perianthio breviora, nuda; *antheræ* versatiles. *Ovarium* ovatum, acuminatum, trisulcatum, vacuum. Flor. fœm. *Perianthium* ut in *fl. masc.*, sed *foliolis* post anthesin erectis, demum deciduis. *Stamina* 6, *antheris* incompletis. *Ovarium* late ovatum, profunde trisulcatum, triloculare, lobis dorso canaliculatis, loculis bi- rarius uniovulatis. *Ovula*, ubi 2, collateralia, funiculis brevibus infra apicem loculi angulo interiori suspensa. *Stylus* validus, erectus, teres. *Stigma* capitatum, parvum, obscure 3–6-lobum. *Capsula* ovata, trilocularis, loculicide trivalvis; *valvæ* coriaceo-submembranaceæ, intus medio septiferæ. *Semina* loculis plerumque bina, collateralia, triquetra; *testa* atra, subcrustacea; *albumen* corneum; *embryo* axilis, paulo curvatus, albumine parum brevior; *radicula* incrassata.—Herba *speciosa, elata, perennis*, Aucklandica, *et in insula* Campbell *proveniens*. Radix *elongata, tuberibus elongatis fasciculatis donata*. Folia *late ensiformia, basi vaginantia*. Scapi *solitarii v. plurimi, pedales et ultra*. Flores *racemosi, aurantiaci*.

1. Chrysobactron *Rossii*, Hook. fil. (Tab. XLIV. & XLV.)

Radix, rhizoma horizontale seu perpendiculare, crassum, carnosum, 1–2 unc. longum, pollicis humanæ et ultra diametr., transverse rugosum, hic illic constrictum, atrum, tubera elongata, fasciculata undique emittens. *Tubera* cylindrica, 2–3 uncialia, carnosa, atro-fusca, crassitie pennæ anserinæ, fibris crassis intermixta. *Collum* validum, brevissimum, simplex v. rarius bi- triceps, tuberibus minoribus, horizontaliter patentibus circumdatum. *Caulis* nullus. *Folia* plurima, circiter 12–16, omnia radicalia, erecto-patentia, inferiora horizontalia v. recurva, elongata, interdum bipedalia, lato-ensiformia, 2–4 unc. lata, integerrima, obtusa v. subacuta, superne præcipue concava, plurinervia, nervis approximatis et venis transversis inconspicuis reticulata, læte viridia, nitida, subtus pallidiora, crassa, herbacea, basi longe vaginantia; *vaginis* 3–4 unc. longis, integris, striatis; ore obliquo submembranaceo; sinu obtuso. *Scapi* solitarii vel non raro plurimi, 6–8, erecti, validi, pedales, ¼–½ unc. diametr., striati, ad apices canaliculati, intus spongiosi, fructiferi et anni præteriti emarcidi, fistulosi, dealbati. *Racemi* conspicui, erecti, 4–7 unc. longi, 1½–2 unc. diametr.; *masculi* breviores, subconico-ovati, pedicellis nempe florum inferiorum elongatis, horizontales, apice attenuati, subacuti; *fœminei* elongati, cylindracei, obtusi, paulo angustiores; *rachis* infra pedicellos sulcata, sæpe medio turgida, vacua, vel per totam longitudinem fistulosa. *Flores* numerosissimi, conferti, pedicellati, odore suavi. *Pedicelli* graciles, ½–1 unc. longi, in *floribus fœmineis* suberecti, fructiferi subincrassati, erecti, basi bracteolati. *Bracteolæ* lineari-elongatæ, obtusæ v. subacutæ, pedicellis nunc longiores, sed sæpius abbreviatæ, foliaceæ, floribus concolores. *Perianthium* corollinum, hexaphyllum, aureum, 3–4 lin. diametr.; *foliola* lineari-oblonga, v. oblongo-ovata, supra medium paulo contracta, costa paulo incrassata e nervis 3 approximatis, valde inconspicuis formata, 3 interiora vix ac ne vix minora, *floribus masculis* patentia, ad apices subincurva, *fœmineis* erecto-patentia, post anthesin erecta, capsulæ immaturæ appressa, dein decidua. *Stamina* 6, foliolis perianthii opposita, iis breviora, hypogyna, erecto-patentia; *filamenta* valida, elongato-subulata, teretia, glaberrima; *antheræ* versatiles, oblongæ; loculis parallelis, contiguis, rimis longitudinalibus dehiscentibus; in floribus fœmineis imperfectis, vacuis. *Pollen* flavum, ovoideum, longitudinaliter bi- vel trisulcatum. *Ovarium, fl. masc.*, elongato-ovatum, trisulcatum, apice acutum v. trifidum, una cum perianthio marcescens et deciduum; *fl. fœm.* late ovatum, turgidum, 2 lin. longum, obscure trigonum, angulis obtusis, 3-sulcatum, 3-loculare; loculi 2- rarius 1-ovulati; *ovula* collateralia, ex angulo interno infra apicem loculi orta, funiculis brevibus suspensa. *Stylus* terminalis, erectus, validus, teres, longitudine ovarium æquans, *stigmate* parvo, subcapitato, obscure 3–6-lobato terminatus. *Capsulæ* late ovatæ, 3–4 lin. longæ, submembranaceæ, 3-loculares, loculicido trivalves; *valvæ* ellipticæ, dorso canaliculatæ; *dissepimenta* membranacea. *Semina* elliptico-ovata, triquetra,

Chrysobactron Rossii. Hook. fil.

pres. lith. Linn. imp.

dorso convexa; dum solitaria latiora, intus carinata. *Testa* utrinque in alam producta; membrana exterior laxa, membranacea, atro-fusca; interna crustacea, aterrima, nitida, sub lente impresso-punctata. *Albumen* carnosum, pallide viride. *Embryo* axilis, filiformis, teres, paulo arcuatus, carnosus, viridis, albumine parum brevior; extremitate radiculari incrassata, obtusa:—*Monstra*, racemis bifidis, seu scapis divisis, dicephalis, non raro occurrunt.

I am unable to refer this to any described genus of *Asphodeleæ*, and have adopted the name* in allusion to the magnificent racemes of golden-yellow flowers which it bears. It will rank near *Anthericum*, L., from which it differs in having only one or at most two ovules and in the erect style. It is also very nearly allied to *Bulbinella*, Kunth (En. Plant. vol. iv. p. 569), especially in general appearance; but in that genus the perianth is persistent, a character probably of more importance than the number of ovules or bearded filaments, which have hitherto been considered sufficient to distinguish genera too nearly allied in other respects.

Perhaps no group of islands on the surface of the globe, of the same limited extent and so perfectly isolated, can boast of three such beautiful plants, peculiar to their flora, as the *Pleurophyllum speciosum* (Plate XXII. & XXIII.), *Celmisia vernicosa* (Plate XXVI. & XXVII.), and the subject of the foregoing description. The last, from its greater abundance and conspicuous colour, is certainly the most striking of the three, not only giving a feature to the landscape wherever it grows, but in Campbell's Island covering the swampy sides of the hills in such profusion as to be distinctly visible at the distance of a full mile from shore. The specific name I have given in compliment to Sir James Ross, who, during our two days' stay in this island, brought to me, amongst many other new plants, one most luxuriant specimen of this, having three crowns of leaves from one root and no less than seven racemes of flowers, some of which were bifid; it was between three and four feet high; I much regretted the impossibility of preserving it whole, and the necessity there was of cutting it up into many fragments. The difficulty of preserving specimens at all, in latitudes so constantly wet and stormy, is very great; especially on board ship, where, from the vicissitudes of the climate, they can rarely be exposed to the air on deck: the operation is rendered doubly tedious, when, as in the islands under consideration, the vegetation is of a very succulent and coriaceous consistence. Most of my specimens required to be changed daily, and the papers to be dried over a long smoke funnel which traversed Captain Ross's cabin, the limited accommodation of our ships affording no other place available for this purpose. But for this privilege, constantly allowed me during the voyage, and which to any one less devoted than that officer to the objects of the expedition must have proved an insupportable annoyance, my collections would have been small indeed. The present plant was collected on the 15th of December 1840, but not fully dried when we had reached the 78th degree of latitude in February 1841.

It is very natural that the great size and luxuriance of this and several other plants of the high southern latitudes should excite surprise. Arguing from those countries in the northern hemisphere which are upon the limits of terrestrial vegetation and which have a similarly rigorous climate, the vegetation of the former might be expected to consist of small and densely tufted plants. This is however not the case, and I have endeavoured to account for the apparent anomaly from the fact that the higher southern regions enjoy a singularly equable, though to the human constitution always inclement climate. It is further to be remarked, that the Flora, even under these circumstances of a peculiar luxuriance in individuals, is composed of very few species; and again, that in the South, hardly any state of vegetation is met with between that of considerable abundance and almost complete sterility, and on ascending the mountains few or no new forms occur: the great mass of the alpine plants (even on the limits of perpetual snow) being those which inhabit the open lands at the level of the ocean. The botany of the densely wooded regions of the southern islands of the New Zealand group and of Fuegia is much more meagre, not only than that of similarly clothed regions in Europe, but of islands many degrees nearer the North-

* Derived from *χρυσὸς, gold*, and *βάκτρον, a staff*.

ern Pole than these are to the opposite one. Iceland for instance, in lat. 62° N., proverbially barren as it is, and upon which no tree, but a few stunted birches, is to be found, contains certainly five times as many flowering plants as Lord Auckland's group and Campbell's Island together, whose rich vegetation is evident on their being first approached from sea; and yet the numerical proportion which the two great groups of flowering plants bear to one another in each country is almost identical. Kerguelen's Land is on the southern limit of vegetation in its own longitude, as we may presume from its containing only eighteen species of flowering plants; but these cover as much of the surface of the island as the plants of Spitzbergen do, and yet the latter country contains forty-five species, though on the verge of Arctic vegetation and infinitely nearer the Pole. Lastly, on Walden Island (lat. 80½° N.) we have the last traces of phænogamic plants in the northern hemisphere, and in the opposite one beyond the South Shetlands (63° S.) no flowering plants exist; but whilst the former islet boasts of ten species of flowering plants, the latter contains but a solitary grass.

The uniformity of the Flora at the different levels in any given island of the South is to be expected from the paucity of species, and we further find that these are spread over vast extents of country. This is remarkably the case with the southern American Flora, where the northern limit at which the antarctic Beech grows near the sea is 45°, from which latitude as far as 56° S. the level of the ocean seems to be its natural habitat: again, the plants which form the bogs of the Chonos Archipelago in lat. 45° S. are the same as those of Cape Horn, and the general features of the vegetation of the two localities are the same. In the northern temperate regions a very different state of things will be found to prevail: compare the Flora of the south of France, in the latitude of the Chonos Archipelago, with that of Argyleshire in the parallel of Cape Horn, and how little similarity exists; and this not only because the plants of France cannot bear the climate of Scotland, but because new forms are developed in the latter country, equally unsuited to the south of France. Many parallel cases to this might be adduced, all tending to prove that there are conditions in the physical geography of the southern islands which render them unfavourable to the production of species, but which are accompanied with a luxuriant development of such as do exist: and further, that species which form the mass of the vegetation under these conditions are such as continue to be typical of the Flora through many degrees of latitude whose mean temperature is considerably different.

The equable climate which these countries now under consideration enjoy, is doubtless mainly attributable to the vast body of ocean surrounding them; and though the want of new species must in a measure depend on the limited extent of surface for their development, it is not altogether from the want of space that the paucity of new forms in proceeding to the South is to be accounted for, since in no other part of the globe can sixteen degrees of so luxuriant a Flora composed of so few species be traversed.

All parts of antarctic America as it is called, a name its ungenial climate alone, and not its geographical position, warrants, are wet, foggy and cold; snow-storms and gales of wind prevail throughout the year; and not only on the hills, for the atmosphere seems so loaded with moisture, that a precipitation on the upper regions is generally followed at once by rain or snow on the lower grounds. In the summer the sun scarcely exerts any power without raising mists which intercept its rays. The difference between the summer and winter temperature is small, and the diurnal changes trifling. The perennial hurricanes which sweep the exposed surfaces of the hills seem alone materially to check the vegetation, for even on the mountains the plants of the plains reappear wherever a shelter is afforded. In no part of Scotland does 1700 feet of elevation exist without showing a material change in the vegetable kingdom, such a height producing many subalpine and even alpine plants not met with at the level of the ocean; but though in Hermite Island the mountains attain that height, there is scarcely a plant growing upon them which does not equally exist in the open grounds near the sea. Nor is there probably any country where the prevailing species, forming the mass of the Flora, have such wide ranges as in Antarctic America.

From this we may presume, that plants will pass through many degrees of latitude, and consequently from

one climate to another, provided there is no sudden change of temperature to check their progress*; that is to say, if in each climate the difference between the extremes is the same, small, and that change slow; and that we may expect the range of individual species to increase with the uniformity of the temperature throughout the year.

The above observations have been drawn chiefly from a consideration of the antarctic American Flora, which is the only one sufficiently investigated hitherto for this purpose. The plants of the Middle Island of New Zealand are only known from the collections of Banks and Solander, Forster and Menzies, which were made in Queen Charlotte's Sound and Dusky Bay, chiefly in the latter; those of the Southern or Stewart's Island are entirely unknown; the Northern Island may be considered as pretty well explored, but an aggregate of the whole shows the Flora of New Zealand to be in all probability the poorest of any country of its size situated in the same latitude. Though this group extends from lat. 34° to the 48th degree, the summers of the northern extremity are not scorching, nor the winters, in its southern, severe. It is true that its high mountains have been but partially explored; but botanists have ascended them, as Mr. Bidwill, Dr. Dieffenbach, and Mr. Colenso, in whose collections the amount of new forms from so considerable an altitude as that of 6–10,000 feet is very trifling, and the species brought by each person the same. In the immediate neighbourhood of Port Jackson, 400 species of flowering plants may be easily collected in four days' excursions; in the same time scarcely half that number would be detected in the Bay of Islands, very little to the southward of Sydney in latitude; and on extending the journeys further in each country to thirty or forty miles, the disproportion increases. A remarkable uniformity in the Flora pervades all the South Sea Islands, also accompanied with a singularly equable temperature. The change which an elevation of 10,000 feet produces in the Flora of Colombia is complete, and the number of species inhabiting the plains of Quito much exceeds that in the low forests of the west coast of America, in the same parallel; but though the volcanic islands of the Sandwich group attain a greater elevation than this, there is no such development of new species at the upper level.

Amongst the many branches of inquiry into which the science of Botanical Geography divides itself, that which concerns the comparative richness in species of countries similarly situated is a highly interesting one. An exuberant vegetation we find not to be necessarily the index of an extensive flora, nor is it in the most densely clothed spots that the greatest variety of forms is to be met with, but very often the contrary. Few lands we have seen are so deceptive in this respect as New Zealand and Tierra del Fuego; and on extending the inquiry, we further see that the sandy plains of Australia, the Cape of Good Hope, and the campos of central Brazil, are richer in species than the more luxuriant woods of those or most other countries.

PLATE XLIV. & XLV. *Fig.* 1, a male flower; *fig.* 2, petal; *fig.* 3, stamen; *fig.* 4, pollen; *fig.* 5, imperfect ovarium of male flower; *fig.* 6, female flower with pedicel and bractea; *fig.* 7, ovarium from do.; *fig.* 8, ovule; *fig.* 9, immature capsule; *fig.* 10, longitudinal, and *fig.* 11, transverse section of do.; *fig.* 12, ripe capsule, the valves burst open; *fig.* 13, side, and *fig.* 14, front view of a seed; *fig.* 15, transverse section of do., showing the outer membrane; *fig.* 16, albumen coated with the inner membrane removed from the outer; *fig.* 17, embryo: —all *magnified.*

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* A familiar instance of the advantage of slow changes of temperature in enabling plants to endure transportation, is found in the application of Mr. Ward's glazed cases for transmitting plants to England through different climates. One of the main features of his philosophical contrivance is, that their construction induces a slow change of temperature in the atmosphere immediately surrounding the plants, and prevents their suffering from any sudden variations.

'Genus inter ASPHODELEAS et JUNCEAS."—*Brown.*

ASTELIA, *Banks et Soland.*

Flores polygamo-dioici. Herm. Masc. *Perianthium* semiglumaceum, sexfidum v. profunde sexpartitum; *laciniis* oblongis lineari-oblongisve, sub apice incrassatis, 3 exterioribus paulo majoribus, dorso sericeis. *Stamina* 6, laciniis perianthii inserta; *filamentis* brevibus v. elongatis; *antheris* brevibus, didymis, introrsis; *pollen* ovoideum v. angulatum, granulatum v. minutissime echinulatum, latere unico excavatum. *Ovarium* abortivum. Fl. Herm. Fœm. *Perianthium* ut in masculo, persistens. *Stamina* imperfecta. *Ovarium* oblongum v. globosum, obtuse trigonum v. trilobum, uni- tri- sexloculare. *Ovula* plurima, biserialia, ascendentia, anatropa. *Placentæ* in ovariis unilocularibus 3-seriales, parietales, v. summo loculi affixæ; in iis trilocularibus angulo interiore superne suspensæ. *Stylus* brevissimus, crassus, teres, sæpius subnullus. *Stigma* sessile, trilobum. *Bacca* turgida, globosa v. elongata, perianthio emarcido v. rarius baccato suffulta v. inclusa et stigmate plerumque coronata, interdum submembranacea uni- trilocularis, rarius 5–6-locularis, loculis 2-polyspermis. *Semina* ovoidea v. angulata, ad raphin incrassata v. subcarinata, in bacca uniloculari plurima, interdum pulpa immersa, horizontalia, biserialia, rarius pendula; in bacca pluriloculari ex apice loculi pendula; funiculis brevibus; umbilico nudo. *Membrana* seminis externa crustacea, interdum ossea, aterrima, nitida. *Nucleus* pendulus; *membrana* interior tenuis, chalaza lata orbiculari ope raphis cum umbilico junctus. *Albumen* dense carnosum. *Embryo* parvus in basi albuminis inclusus, extremitate radiculari incrassata hilo proxima.—Herbæ *insularum Oceani Pacifici et Antarctici, Novæ Zelandiæ Tasmaniæque incolæ, nullibi copiosæ, cæspitosæ, plus minusve sericeo-paleaceæ.* Caules *breviusculi, foliosi.* Folia *elongata, plerumque carinata, trinervia.* Flores *racemosi, paniculati v. scapis abbreviatis bini, basi bracteolati.*

1. Astelia *linearis*, Hook. fil.; foliis patulis lineari-elongatis acutis canaliculatis appresse argenteo-paleaceis sericeis v. glabriusculis subtus carinatis, scapo perbrevi 1–2-flore, flore inferiore basi bracteato, bacca lineari-oblonga carnosa obtuse trigona 1-loculari, seminibus plurimis placentis parietalibus affixis.

Var. β. *subulata*; pumila, foliis lineari-subulatis.

Hab. Lord Auckland's group and Campbell's Island; on the bare ground, not uncommon, especially on the hills in open places.

Species pusilla, polymorpha, dense cæspitosa, habitu *A. alpinæ* et *pumilæ* sed foliis multoties angustioribus, magnitudine varians. *Radix* lignosa, fusiformis, descendens, parce fibrosa, fibris patentibus, flexuosis, elongatis, 2–3 unc. longis, 1 lin. diametr. *Caules* breviusculi, ½–3 unc. longi, densissime compacti, pluries divisi, vaginis fuscis foliorum obtecti, una cum foliis ¼–¾ unc. diametri, basi reliquiis fibrosis et squamosis foliorum vetustorum obsiti. *Folia* omnia radicalia, inferiora interdum recurva, undique patentia, (an obscure trifariam imbricata?) basi late vaginantia, 2–4 unc. longa (in var. β. ¼–½ uncialia), lineari-elongata v. rarius anguste lanceolata, 2–3 lin. lata, gradatim acuminata, crassa et coriacea, supra profunde sulcata v. canaliculata, ad margines plerumque recurva, subtus medio carinata, utrinque plus minusve paleis squamisve argenteis v. rufofuscis obtecta v. subsericea, interdum sed rarius glaberrima, luride viridia, ad apices fasciculo squamarum penicillata; *vaginæ* latiusculæ, scarioso-membranaceæ, squamosæ; squamis hyalinis, appressis, elongatis, fimbriato-laceris, deciduis. *Scapus* solitarius, perbrevis, ½ unc. longus, inter vaginas foliorum occlusus, argenteo-squamosus, apice bifidus, biflorus. *Flores* approximati, erecti; inferior subsessilis, basi bracteatus; superior pedicellatus. *Bractea* lineari-elongata, obtusa, utrinque furfuraceo-squamosa. Fl. Masc. mihi ignoti. Fœm. *Perianthium* sexpartitum; laciniæ lineares, obtusæ, exteriores majores, extus sericeæ, versus apices incrassatæ, subcucullatæ, dorso penicillatæ, interiores angustiores, apicibus subincrassatis. *Stamina* imo perianthii inserta,

parva, imperfecta. *Ovarium* ovato-oblongum, obtuse trigonum, stigmate trilobo sessili terminatum, uniloculare. *Placentæ* parietales, triseriales, nerviformes. *Ovula* plurima, biserialia, semi-anatropa, ascendentia. *Bacca* carnosa, oblongo-elongata, ½ unc. longa, prismatica, angulis obtusis, pallide rufa, perianthio duplo longior. *Semina* plurima, horizontalia, obovata, obtusa, latere unico compressa, subcarinata; *funiculus* crassiusculus, subelongatus, filamentosus; membrana exterior crustacea, subossea, aterrima, nitida; *nucleus* pendulus solutus, chalaza orbiculari apiceque fusca; membrana interior tenuis, pallide fusca. *Albumen* carnosum. *Embryo* parvus, ovatus, basi albuminis inclusus; *radicula* hilo proxima.

Since the first appearance of the 'Prodromus Floræ Nov. Holl.,' in which Mr. Brown published the genus *Astelia* from the manuscripts of Banks and Solander, nothing seems to have been done by the many authors who have transcribed his characters and remarks towards determining its affinities. Mr. Brown himself views it as intermediate between *Asphodeleæ* and *Junceæ*, and retains it at the end of the former order; from this it has been removed with one consent by all future classifiers, some placing it after *Junceæ* and others with *Melanthaceæ*. Mr. Forster's name of *Melanthium pumilum*, given to the Fuegian species, shows that he considered it as being most nearly allied to the latter-named order; but I am not aware that any other author has stated his reasons for following Forster's views of its affinity, except perhaps Thunberg, whose dissertation *de Melanthaceis* I have never seen.

In 1819 Sir J. E. Smith (Appendix to Rees's Cyclopædia) added a new species to the genus, the *A. Menziesiana* of the Sandwich Islands; the form of the seeds is mentioned, but no particulars of their structure. This species was redescribed by Gaudichaud (Voy. Freyc. Bot. p. 420), who does not seem to have been aware of Sir James Smith's paper, and he named it *A. veratroides*, placing it in *Melanthaceæ* without any remark; the fruit seems unknown to Gaudichaud, but was described as three-celled by Smith and again by Hooker and Arnott (Bot. Beechey Voy. p. 97), who also retain it in the same order.

A. Richard published his 'Flora Novæ Zelandiæ' in 1830, wherein no notice is taken of the genus *Astelia*, but a species of it is figured and described as *Hamelinia* (nov. gen.) *veratroides*: the male flowers and ripe fruit appear to have been both unknown to that author, the ovary is described as trilocular, and the genus arranged in *Colchicaceæ* (*Melanthaceæ*).

In 1836 Mr. Cunningham described (in his Prodr. Flor. Nov. Zel.) two species of *Astelia*, under one of which (*A. Banksii*), Richard's *Hamelinia* is quoted as a synonym; it is placed in *Junci*. Shortly afterwards Endlicher (in his 'Genera Plantarum') removed it to the end of *Junceæ*. Lastly, Kunth takes up the genus *Astelia* (Enum. Plant. vol. iii. p. 364) and follows Endlicher's views of its affinity. Though however his work was published as late as 1841, all notice of Cunningham's species are omitted, and the *A. Banksii* receives the third name of *A. Richardi*.

I have had the opportunity of examining the ripe fruit of six species of the genus, and find the seeds of all to agree in structure and to partake of the peculiarities both of *Liliaceæ* and *Junceæ*; with *Melanthaceæ* they have fewer characters in common.

Except in the more fleshy substance of the capsule in most of the species and its not bursting by valves, to which however there is a manifest tendency in the *A. pumila*, there is no material difference in that organ between *Astelia* and *Juncus*. The *ovaria* are the same in both, being one or more celled; when one-celled generally bearing the anatropous ovules in two series on three lines of parietal placentæ, and when three-celled they are pendent from the inner angles of the cells. The internal structure of the seeds of the two genera is identical; the outer coat alone, from becoming thick and even in *Astelia*, agrees only with *Rostkovia* amongst *Junceæ*, but in being crustaceous and black differs from all. The nucleus, raphe, chalaza, inner coat of the seed immediately surrounding the albumen, the albumen itself, and form and position of the embryo, are precisely alike in both. Together with these remarkable accordances in structure there are many points of discrepancy, especially in habit, as also in the chaffy covering of the leaves and other parts, the uniformly dicœcious or poly-

gamous flowers, the texture of the leaflets of the perianth and their being often united above the base, the subulate and generally terete, not linear or compressed filaments, the short anthers and different nature of the pollen, which is minutely granular and furrowed on one side, and the constantly nearly sessile and three-lobed stigma.

With *Asphodeleæ*, *Astelia* has many points in common: though, as stated above, the internal structure of the seed is more manifestly that of *Junceæ*, it is not opposed to the description of that organ in *Asphodeleæ*, and the brittle black shining testa is almost typical of that order. The stamens are the same, in some *Asteliæ* being much elongated and bearing versatile anthers; and the form of the pollen likewise, though I have always observed it to be granulated. The thickened and subincurved apices of the leaflets of the perianth are analogous to the cucullate tips of these organs in *Drimia* and *Albuca*. The form of the perianth is variable in the New Zealand species, nor is its texture always peculiarly semi-glumaceous, as in one species the laciniæ, which are linear, are also thin, membranous and white; in another it expands at the base into a broad, flattened or cup-shaped disc with six equal lobes; in a third the base is subcampanulate, with erect linear laciniæ, subpetaloid in texture; and in a fourth species it completely surrounds the ripe berries, which are very large. Nor is the berry itself very constant in internal structure, as in *Dianella*, Lam., amongst *Asphodeleæ*, it is baccate, and as in *Allium*, L., it varies in the number of cells from one to three. In one of the above New Zealand species it is, as far as I can judge from dried specimens, one-celled, with many seeds pendulous from the summit, attached by short *funiculi* to what probably was a fleshy pendent column, but of which I see only the membranous remains; if any dissepiments existed they must have been very imperfect. Another species has the berry constantly three-celled, with several seeds pendulous from the upper inner angle of the cell; and in a third the fruit is membranous and subcapsular with three to six cells, each containing two or more pendulous seeds, which are convex at the back and with the sides much compressed like those of many *Asphodeleæ*. To *Melanthaceæ* the genus is allied in habit, in the polygamous flowers, in the perianth sometimes (exactly similar to that of *Wurmbia*, Thunb.) forming a tube round the fruit, in the baccate fruit, and in the form and surface of the pollen, which in some *Melanthaceæ* is minutely granular: from this order however they essentially differ, in the æstivation of the perianth not being induplicate, in the anthers being at no period extrorse, in the single style, sessile, lobed stigma, and in the crustaceous integument of the seed. Whilst alluding to this order I may mention another plant whose affinity has been considered dubious, the *Campynema linearis*, Lab. (Flor. Nov. Holl. vol. i. p. 93. t. 121). This I have lately examined, and find it to be, as Mr. Brown rightly conjectured (Prodr. p. 290), truly *Melanthaceous*, with the tube of the perianth united to the ovarium. The fruits I have only seen in an immature state; but in them the adhesion of the perianth to the capsule is evident, and in a forwarder state the line of separation would doubtless be more clear. The plant is dicœcious or probably polygamous, the anthers extrorse and caducous, the filaments after their falling away becoming recurved and projecting between the segments of the perianth; the pollen is yellow and granulate. The immature seeds are very numerous, imbricated in two series in each cell, and are attached to the middle of the dissepiments.

I have not ventured to subdivide the genus *Astelia*, as I doubt if characters of sufficient importance will be found to render it necessary, especially until good specimens in all states of the New Zealand species shall have been examined. The *A. pumila*, Br., is the most abnormal species in habit and in the subcapsular fruit; it is allied to the Tasmanian *A. alpina*, Br. in the form of that organ and shape of the leaves, and, on the other hand, to *A. linearis* in the short two-flowered scape. The *A. alpina* again, having a racemose inflorescence, connects these with the New Zealand species, in one of which the ovarium is one-celled. There are probably two species in the Sandwich group, one of which has two seeds in each of the cells of the berry and the seed-coat is very thick and osseous.

The *A. linearis* is the most inconspicuous of any of the species, owing to the grassy appearance of the leaves and its small size. Both the *A. pumila* and *A. alpina* are very striking plants; the former constituting singular hard flat green beds on the bogs, often several yards across; while the latter, with its beautifully silky and copious foliage, is a great ornament to the top of Mount Wellington and other mountains of Tasmania.

et lith.

prel. lith. Linn. imp.

Juncus antarcticus. Hook. fil.

Some of the New Zealand species are wonderful features in the forest scenery of those islands; they form huge tufted masses, often as large as the human body, perched on the naked limbs of the most lofty pines; elevated as they are 80–100 feet above the ground, they remind the beholder of the nest of some gigantic bird.

XXVIII. JUNCEÆ, *DeC.*

JUNCUS, *L.*

1. JUNCUS *antarcticus*, Hook. fil.; pumilus, cæspitosus, culmo terete superne nudo foliis subæquilongo, foliis radicalibus e basi vaginante linearibus semiteretibus versus apices obtusos cylindraceis, floribus 2–4 capitatis hexandris, perianthii foliolis subulato-lanceolatis exterioribus concavis dorso acutis, stylo nullo, capsula perianthii longitudine triloculari. (TAB. XLVI.)

HAB. Campbell's Island; on the exposed summits of the mountains: alt. 1000 feet, rare.

Plantæ perpusillæ, vix unciam longæ, inter muscos cæspites densos formantes. *Radix* fibrosa; fibris elongatis, tortuosis. *Culmi* erecti, $\frac{1}{4}$–$\frac{1}{2}$ unc. longi, ima basi divisi, rarius parce ramosi, reliquiis foliorum vetustorum vaginati, foliosi. *Folia* plurima, radicalia, numerosa, sub $\frac{1}{2}$ unc. longa, basi vaginantia, suberecta vel paulo curvata, e basi latiore lineari-subulata v. linearia, semiteretia v. superne obscure canaliculata, versus apices cylindracea, obtusa; basi vaginante elongato-ovata, medio coriacea, striata, marginibus subscariosis. *Scapi* solitarii, rarius bini, stricti, erecti, subvalidi, foliis breviores, post anthesin elongati. *Flores* plerumque 3, capitati, basi bibracteolati, unico non raro incompleto, altero breviter pedicellato. *Bracteolæ* ovatæ, acuminatæ, longitudine variæ, flores plerumque superantes, unica interdum subelongata, folium simulante. *Perianthium* $1\frac{1}{2}$ lin. longum, castaneum, nitidum; *foliola* subæqualia; exteriora lanceolato-subulata, coriacea, concava, dorso acuta, vix carinata; interiora planiuscula, sublatiora, medio coriacea, marginibus anguste membranaceis. *Stamina* 6; *filamenta* latiuscula, plana, uninervia; *antheræ* oblongæ, subrecurvæ, apice brevissime unguiculatæ. *Ovarium* parvum, obovatum, turgidum, triloculare, in stylum non attenuatum; *valvis* dorso carinatis. *Stigmata* 3, sessilia, inclusa, lineari-subulata, post anthesin torta. *Ovula* plurima, angulo interno loculi biserialia. *Capsula* perianthio inclusa, castanea, ovata v. ovato-oblonga, subacuta, 3-locularis, 3-valvis; *valvæ* convexæ, medio dorso canaliculatæ, intus septiferæ; *dissepimentis* in axi capsulæ primo inter se cohærentibus, denique solutis. *Semina* plurima, quovis loculo 15–20, funiculis brevibus margini septorum adnexa, ovato- v. elliptico-oblonga, obtusa, flavo-brunnea; *funiculi* incrassati, reliquiis filamentosis membranæ externæ seminis circumdati: *testa* membranacea, pallide flavo-brunnea, obsolete striata v. reticulata.

This curious little species is allied to none with which I am acquainted; in size and general appearance it somewhat resembles the *Luzula arcuata*, Hook., of the Scottish Alps. The form of the leaves is that of *Juncus castaneus*, Sm., but they are in this plant solid internally and of quite a different structure. The capitate flowers and naked scapes are common to this, with the *J. biglumis*, L., *J. triglumis*, L., and with the following.

† PLATE XLVI. *Fig.* 1, leaf; *fig.* 2, section of central part of do.; *fig.* 3, upper part of do.; *fig.* 4, capitulum; *fig.* 5, flower; *fig.* 6, outer leaflet of perianth; *fig.* 7, inner leaflet of do.; *fig.* 8, stamen; *fig.* 9, ovarium; *fig.* 10, capsule inclosed in perianth; *fig.* 11, the same removed with the valves burst open; *fig.* 12, transverse section of do.; *fig.* 13, one valve of capsule; *fig.* 14, seeds:—all *magnified*.

2. JUNCUS *scheuchzerioides*, Gaud.; culmo brevissimo compresso basi fastigiatim ramoso, foliis erectis longissime lineari-subulatis compressis basi longe vaginantibus intus articulatis, scapo brevissimo foliis multoties breviore, floribus 6–8 capitatis hexandris bractea elongata subtensis, perianthii foliolis ovato-lanceolatis medio coriaceis omnibus planiusculis, stylo elongato, capsula perianthio

sublongiore semitriloculari.—*Gaud. in Ann. Sc. Nat.* vol. v. p. 100, *et in Freyc. Voy. Bot.* pp. 132 & 419. *D'Urv. Fl. Ins. Mal. in Trans. Soc. Linn. Paris,* vol. iii. p. 124. *Rœm. et Schultes,* vol. vii. pt. 1. p. 196. *La Harpe, Junc.* 36. *Kunth, En. Plant.* vol. iii. p. 325.—Var. β. *inconspicuus.* J. inconspicuus, *D'Urv., Gaud., La Harpe,* locis citatis.

HAB. Lord Auckland's group and Campbell's Island; sparingly in marshy places near the tops of the hills, alt. 1000 feet; more abundant in the latter island at the level of the sea. β. Campbell's Island, not uncommon in gravelly places.

Culmi brevissimi, sub ½ unc. longi, sæpius pluries divisi, surculos radicantes interdum lateraliter emittentes, basi fibrosi; fibris simplicibus. *Folia* subdistiche inserta, stricta, erecta, basi longe vaginantia, longitudine varia, in var. β. plerumque vix ½ unc. longa, sed exemplaribus plerisque 4–8 uncialia, per totam longitudinem compressa, in acumen curvatum v. uncinatum sæpe ad apicem attenuata, herbacea et subgraminea, nunquam dura v. coriacea, striata, pallide viridia; intus fistulosa, transverse articulata, nodis siccitate solummodo externe conspicuis, internodiis 2–4 lin. longis, nervis prominentibus costatis; *vaginæ* ¼–⅓ folii æquantes, membranaceo-dilatatæ, superne oblique rotundatæ v. truncatæ, seu in auriculas interdum sursum productæ. *Scapi* foliis ¼–⅓ breviores, graciles, teretes vel paulo compressi, superne nudi. *Capitula* 4–8-flora, bractea foliiformi, plus minusve elongata subtensa. *Bracteolæ* late ovatæ, acuminatæ, 3–5-nerves, dorso infra apicem carinatæ. *Perianthii* foliola exteriora vix concava, ovato-lanceolata, acuminata, medio coriacea, trinervia, dorso subcarinata; marginibus late membranaceis, subscariosis, infra apicem involutis, fusco-purpureis; *interiora* planiuscula, ovato-oblonga, obtusa v. breviter acuminata, medio incrassata, nervosa, viridia; marginibus albidis v. pallide fuscis, late membranaceis. *Stamina* foliolis perianthii breviora; *filamenta* plana, linearia, subelongata; *antheræ* lineari-oblongæ, apice breviter unguiculatæ. *Ovarium* triquetrum, triloculare. *Stylus* erectus. *Stigmata* 3, elongato-filiformia, horizontaliter patentia, post anthesin torta. *Capsula* ovato-oblonga, perianthio paulo longior, trigona, angulis obtusis, 3-valvis; *valvæ* dorso concavæ, medio subcanaliculatæ, septiferæ; *dissepimentis* retractis, polyspermis. *Semina* plurima, biserialia, ovoidea; membrana externa hyalina, filamentosa, tenuissima, caduca, ad raphin incrassata; interna pallide fusca, reticulata, utrinque reliquiis membranæ externæ subfilamentosa; chalaza latiuscula, opaca.

The Auckland and Campbell Island plant is assuredly identical with that of South America, and as a species it is exceedingly distinct from any other with which I am acquainted, except perhaps, as Kunth suggests, the *J. microcephalus*, H. B. K. Of this plant we have copious specimens, but as they are in the hands of Meyer, who is now preparing a monograph of the genus *Juncus*, I am unable to compare them. So far as my recollection serves me, there is much similarity between this species and one from the Andes of South America; but judging from the descriptions of Kunth in Humboldt's Nov. Gen., the *J. microcephalus* differs materially from this in size, in the creeping *rhizoma*, in the leaves being shorter than the scapes, the dichotomous corymb and many other characters; in fact, the articulated leaves, described by Kunth as terete, but by La Harpe as compressed, seem to be almost the only character they possess in common. This is a much more common species than the *J. antarcticus*, and differs as materially from it in the structure of the leaf, as the *J. biglumis* does from *J. triglumis*. The *J. scheuchzerioides* has the leaves of a very soft texture, as are the leaflets of the perianth, none of which are carinated at the back. The difference between the length of the scape and leaf is very remarkable.

I have retained the *J. exiguus*, Gaud., as a variety, though it hardly possesses characters sufficient to rank as such; it consists here, as in the Falkland Islands, of small specimens of the plant, often growing in a poorer soil or drier locality.

2. ROSTKOVIA, *Desv.*

Flos majusculus, solitarius. *Perianthium* glumaceum, hexaphyllum; *foliolis* lineari-subulatis, 3 exterioribus paulo majoribus, dorso acutis. *Stamina* 6, imo perianthii inserta, foliolis opposita; *antheræ* apice unguiculatæ. *Ovarium* oblongum, elongatum v. ovatum, trigonum, uniloculare. *Ovula* plurima, biserialia, placentis 3 parietalibus adnexa, anatropa. *Stylus* validus, elongatus, apice incrassatus. *Stigmata* 3, exserta, maxima, lineari-subulata, intus glandulosa, dorso profunde canaliculata. *Capsula* unilocularis, trivalvis, valvis medio intus carinatis, carinis e septis retractis formatis. *Semina* plurima, horizontalia v. ascendentia. *Testa* varia. *Embryo* minimus, subquadratus, in basi albuminis carnosi inclusus.—Herbæ *Antarcticæ*. Culmi *basi vaginati*. Folia *solitaria v. plurima, elongata, teretia*. Scapi *graciles, apice uniflori, foliis breviores*.—Character ex Desvaux, paucis mutatis.—Rostkovia *et* Marsippospermum, *Desv.*

1. ROSTKOVIA *Magellanica*; culmis cæspitosis simplicibus v. ima basi divisis, foliis plurimis strictis erectis basi vaginantibus longe lineari-subulatis semiteretibus infra medium canaliculatis, scapis foliis longioribus, floribus bractea elongata subtensis, perianthii foliolis ovato-lanceolatis marginibus late scarioso-membranaceis, capsula perianthio paulo longiore, seminum testa albumine conformi coriacea.—Rostkovia sphærocarpa, *Desvaux, Journ. de Bot.* vol. i. p. 327. Juncus Magellanicus, *Lamk. Encycl. Méthod.* iii. p. 266. *Gaud. in Ann. Sc. Nat.* vol. v. p. 100, *et in Freyc. Voy. Bot.* p. 132. *D'Urv. Fl. Ins. Mal. in Ann. Soc. Linn. Paris*, vol. iv. p. 604. *Kunth, En. Plant.* vol. iii. p. 357.

HAB. Campbell's Island; in mossy and springy places on the hills, especially at the sources of streams.

Culmi basi compressi, subelongati, inclinati, fibras crassas emittentes, interdum subsurculosi, simplices vel divisi, rarius parce ramosi. *Folia* plurima, ad basin scapi cujusvis 8–10, erecta, stricta, rigida, longissime lineari-subulata, 5–10 unc. longa, basi longe vaginantia, semiteretia v. obscure trigona, intus solida, supra basi ad medium canaliculata, superne subtriquetra, ad apices pungentia, plus minusve curvata, glaberrima, polita, nitida: vaginæ compressæ, ½–1 unc. longæ, basi 3–4 lin. latæ, subchartaceæ, superne coriaceæ, oblique truncatæ. *Scapi* solitarii v. rarissime duo, erecti, graciles, teretes v. subtrigoni, foliis ⅓–¼ breviores, infra florem solitarium subincrassati, rigidi, solidi. *Bracteæ* ad basin floris 2, valde inæquales; superior e basi ovato-lanceolata subulata, concava, chartacea, perianthium vix superans; inferior concava, e basi vaginante late ovata, longe subulata, erecta, stricta, perianthium bis quaterve superans, interdum folium omnino simulans. *Perianthium* ¼ unc. longum; *foliola* lineari-oblonga, attenuata, acuta v. acuminata, inter se subæqualia; exteriora paulo majora, concava, dorso acuta, superne carinata, coriacea, striata, castanea, nitida, marginibus late scariosis, pallidis; interiora planiora, medio incrassata. *Stamina* 6, inclusa; *filamenta* linearia, medio uninervia, perianthio ½ breviora; *antheræ* lineares, elongatæ, filamentis paulo breviores; connectivo ultra apicem in unguem brevem, obtusum, subrecurvum producto; loculis parallelis, rimis lateralibus dehiscentibus. *Pollen* tetragonum, intus 3–4-granulosum, flavum. *Ovarium* elliptico-ovatum, in stylum attenuatum, obtuse trigonum, 1-loculare. *Placentæ* nerviformes, parietales, dissepimentis obsoletis sitæ. *Ovula* plurima, biserialia, ascendentia, funiculis brevibus placentis adnexa, anatropa. *Stylus* elongatus, erectus, validus, strictus, basi gracilis, superne gradatim incrassatus, ovario æquilongus. *Stigmata* 3, tota exserta, erecto-patentia, subulato-filiformia, ad baseos latiores confluentia, intus per totam longitudinem glandulosa, dorso glaberrima, profunde canaliculata. *Capsula* perianthium superans, late obovato-oblonga, prismatica, angulis obtusiusculis, apice acuta, v. stylo persistente mucronata, dura et coriacea, sublignea, castanea, nitida, quasi vernicosa, unilocularis, polysperma, trivalvis; *valvæ* oblongæ, utrinque acutæ, concavæ, dorso medio canaliculatæ, intus septo incompleto costatæ. *Semina* numerosa, conferta, lentiformia, utrinque obtusa, paulo compressa, latere unico subcarinata, lævia, castanea, nitida, basi pallidiora; *umbilico* nudo. *Membrana seminis* exterior crassa, coriacea, intus spongiosa; interior membranacea, obscure reticulata,

pallide flavo-brunnea, utrinque (chalaza apiceque) fusca, albumini appressa, exteriore remota; inter has duas *raphe* sæpius solutus apparet. *Albumen* carnosum. *Embryo* parvus, albidus, oblique tetragonus, in basi albuminis immersus, hilo proximus.

This species was, according to Lamarck, originally discovered by Commerson, who accompanied Bougainville in his voyage to the Straits of Magalhaens, &c. I have gathered it abundantly both in Tierra del Fuego and the Falkland Islands. In the latter locality it is very abundant, and had been previously detected by M. Gaudichaud and by Admiral D'Urville. It is rare in Campbell's Island, and was not observed upon Lord Auckland's group. It is equally distinct from the *R. grandiflora* (*Marsippospermum grandiflorum*, Desv., Hook. Ic. Plant. t. 533) and from the following, in the elongated bractea which subtends the flower, as well as the size of the plant, form of the leaf and capsule, and curious structure of the seeds. I have no hesitation in retaining Lamarck's specific name of *Magellanica* for this plant, the species being well characterized by that author, and known to Desvaux at the time he established the genus *Rostkovia*; this he did upon different grounds however from those which induce me to retain it.

M. Desvaux founds the genus on this solitary species, but grounds his generic character on an erroneous idea of the structure of the capsule, which he describes (Journ. de Bot. l. c.) as "capsula globosa, unilocularis, non dehiscens; trophospermum suturale" (p. 326); and again in the previous page, "Je crois que la capsule ne s'ouvre point; par suite d'une observation générale, c'est que *tout fruit qui n'est point anguleux dans aucune de ses parties, n'est pas déhiscent, surtout s'il est sphérique* . . . . . les graines en grand nombre sont disposées sur trois trophospermes (placentæ) fixés sur les parois de la capsule et alternant avec les indices de déhiscence qui s'aperçoivent au milieu des parois des loges, et qui sont toujours indiqués, malgré que cette déhiscence n'ait point lieu dans quelques genres de la famille des Joncinées" (p. 325). The capsule of *R. Magellanica* I have described as of a very hard consistence, and its dehiscence does not take place until a considerable period after the apparent ripening of the seeds; that it does burst is however abundantly evident, and the dehiscence takes place by three valves, exactly as in Desvaux's genus *Marsippospermum* and in other *Junceæ*, the placentæ occupying the axis of the valves. From the above extract I conclude that M. Desvaux did not examine fully ripe capsules, and took the groove at the back of the valves, which is seen in almost all *Junci*, denoting the position of the *placentæ*, for the line of dehiscence. In the work alluded to no description of the seeds themselves is given, though another genus is founded on a supposed peculiarity of structure in that organ. Mr. Brown (Prodr. p. 258), in his observations on the genus *Juncus*, remarks that no dependence is to be placed on the form of the *testa* as a generic character, "nec secernendæ eæ seminibus scobiformibus, testa nempe, quæ in pluribus utrinque laxa, in his valde elongata;" and as in the genus *Juncus* itself there are several forms of that organ, so in *Rostkovia*, as it now stands, it differs remarkably in two of the species. In *R. grandiflora* the outer integument of the seed is lax and drawn out at both ends, as in *Juncus castaneus*, Sm., and several other species; but in the *R. Magellanica* it assumes a form which I have not seen in any other species of the Natural Order, forming a very thick, even seed-coat, hard, smooth and shining externally, marked on one side with a prominent ridge, indicating the position of the raphe; within it is soft and spongy, with a large cavity. Inside this the *nucleus* hangs loose, suspended by the vessels of the raphe, which are more or less detached and often quite separate from the walls of the seed-coat, except at the base. The inner membrane immediately surrounds the *albumen*; it is thin and membranous, obscurely striated or reticulated, of a pale brown colour with a broad orbicular dark-coloured *chalaza* at the summit and another dark spot and apiculus at the pendent apex. This membrane is quite free from the outer, and analogous to what is generally considered as the testa in many *Junci* which are described as not having that organ *scobiform*, but in which the true outer membrane of the seed, analogous to the coriaceous one of the present species, is delicate and hyaline, either altogether deciduous or leaving a few filamentous *residua* round the base and apex of the seed, or as in *J. scheuchzerioides*, leaving the raphe as the only attachment between the seed and placenta. In some species of the Order this outer membrane forms with water a transparent jelly, in which the seed appears immersed; it is very similar to what is seen surround-

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Fitch. del. et lith.

Rostkovia gracilis. Hook.fil.

prel: lith: Linn: imp.

ing the moistened achænia of some *Compositæ*. In South American specimens of *R. Magellanica* the seeds are paler and generally angled or compressed; the vessels of the raphe are also seen entirely detached from the walls of the membranes and running quite free between them to the summit of the albumen covered with the inner membrane, which thus appears suspended in the cavity of the outer coat, like the seed of some *Amaranthaceous* plant attached to a long *funiculus*.

The *R. grandiflora* is the type of this genus, to which the name of *Marsippospermum* was given by Desvaux; but from that word denoting a structure in the seed foreign to this species, and not implying a character peculiar to any group of *Junci*, I have substituted that of *Rostkovia*, to include both these and the following. The very peculiar habit and appearance of the species, the singularly large and solitary flowers, unlike those of any *Juncus*, together with the elongated style and the disproportionate size of the stigmata, are characters peculiar to all these, and appear of sufficient importance to warrant the retaining them under a separate generic name. M. Kunth in his 'Enumeratio Plantarum' (vol. iii. p. 356) places the *R. Magellanica* near *Juncus trifidus*, L., a plant to which it has assuredly no affinity, either in habit, inflorescence, or structure of the capsule. The *R. grandiflora* the same author removes to another section, and arranges it (probably following Mr. Brown's suggestion) along with *J. castaneus*, Sm., *biglumis*, L., *triglumis*, L., and some others of more dubious affinity, in a group at the end of the genus.

2. ROSTKOVIA *gracilis*, Hook. fil.; rhizomate valido repente, culmis erectis fastigiatis gracilibus, foliis solitariis elongatis basi squamosis et vaginatis filiformibus teretibus rigidis, scapis solitariis folio ter brevioribus, bractea infra-florali solitaria brevissima obtusa, perianthii foliolis longissime lanceolato-subulatis, capsula lineari-oblonga perianthio multoties breviore. (TAB. XLVII.)

HAB. Lord Auckland's group and Campbell's Island; amongst rocks and also in marshy places; common at an elevation of 800–1200 feet.

Rhizomata cæspitosa, intertexta, horizontaliter repentia, 3–4 unc. longa, valida, crassa, sub $\frac{1}{4}$ unc. diametr., dura, lignea, per totam longitudinem et præcipue versus apices culmos perplurimos superne emittentia, reliquiis foliorum vetustorum ubique vestita, subtus fibrosa; fibris validis, elongatis, 1–2 unc. longis, descendentibus, curvatis, diametro pennæ passerinæ, copiosissime fibrillosis. *Culmi* numerosi, fastigiati, erecti, stricti, teretes, basi squamosi et vaginati; *squamæ* e vaginis junioribus explanatis formatæ, striatæ, nitidæ, castaneæ; *vaginæ* 2–3, folium arcte amplectentes, elongatæ, 1–1$\frac{1}{2}$ unc. longæ, teretes, striatæ, fulvæ v. pallide castaneæ, basi brunneæ, politæ, vernicosæ, ad apices rotundatæ, mucronatæ; mucrone plus minusve elongato, pungente. *Folium* solitarium v. rarius duo, erectum, filiforme, elongatum, $\frac{3}{4}$–1 pedale, gracile, teres, striatum, vix $\frac{1}{2}$ lin. diametr., gradatim acuminatum, apice subpungente, pallide viride, politum, intus spongiosum, fasciculis 8–10 tubulosis intramarginalibus vasorum percursum. *Scapus* erectus, solitarius, gracilis, teres, 2–3 uncialis, folio bis terve brevior, infra florem paulo incrassatus. *Flos* solitarius, majusculus, erectus, $\frac{3}{4}$–1 unc. longus. *Bracteola* infra-floralis solitaria, parva, late ovato-oblonga, obtusa, membranacea, sub lineam longa. *Perianthium* angustum; foliola longe lineari-subulata, gradatim acuminata; exteriora subinæqualia, longiora, et paulo latiora, inferne plana, supra medium concava, dorso carinata, medio pergamentacea, striata, castanea, nitida, marginibus late scariosis; interiora subsimilia sed breviora et angustiora. *Stamina* breviuscula, foliolis interioribus perianthii $\frac{2}{3}$ breviora; *filamenta* brevia, latiuscula, plana, medio uninervia; *antheræ* filamentis quadruplo longiores, lineari-elongatæ; connectivo ultra apicem in unguem obtusum, subrecurvum producto; loculis parallelis, contiguis, rimis lateralibus dehiscentibus. *Pollen* flavum, obtuse tetragonum. *Ovarium* elongatum, ovato-oblongum v. subconicum, obtuse trigonum v. prismaticum, in stylum gradatim acuminatum, uniloculare, pluriovulatum, staminibus brevius. *Placentæ* nerviformes, 3-seriales, a valvis facile divulsæ. *Ovula* plurima, ascendentia, biserialia, funiculis brevibus placentis adnexa. *Stylus* rectus, elongatus, validus, ovario æquilongus, superne subincrassatus. *Stigmata* 3, majuscula, erecta, basi confluentia, perianthio inclusa, filiformi-subulata, intus glandulis pellucidis obsita, dorso

glaberrima, profunde canaliculata; marginibus recurvis. *Capsula* lineari-oblonga, trigona, angulis obtusis, perianthio $\frac{2}{3}$ brevior, unilocularis, trivalvis, polysperma. *Valvæ* lineari-lanceolatæ, acuminatæ, concavæ, coriaceæ, pallide fuscæ, medio intus dissepimento incompleto carinatæ, dorso canaliculatæ. *Semina* — ?

I much regret not finding the seeds of this fine species amongst my dried specimens; a few were contained in the old capsules when first collected, of which I neglected to make any note at the time: if my memory does not deceive me, they were small and covered with a pearly white, very lax and much elongated outer membrane, not unlike that of *Narthecium ossifragum*. It is most remarkable for the apparently entire suppression of one of the bracteolæ at the base of the flower, and also differs from the two other species in having a coriaceous, not indurated capsule. It is more nearly allied to the *R. grandiflora* (*Marsippospermum grandiflorum*, Desv.) than to *R. Magellanica* in size, in the creeping *rhizoma*, the solitary leaf sheathed at the base, the unequal outer leaflets of the perianth, and in the long capsule and lax outer coat of the seed; that plant is however of a much larger size, has longer *rhizomata* and scapes, with two or three *bracteolæ* below the flowers, and an almost woody capsule. The seeds of *R. grandiflora*, like those of *Juncus castaneus* and especially of *J. triglumis*, are fusiform, invested with a loose, pale yellow, lax, glistening membrane, thickened on one side, denoting the position of the *raphe*, and produced at both ends; it is formed of elongated cellular tissue. The *albumen* is covered by a rather thick inner coat, composed of hexagonal cellular tissue, and is pendulous in the cavity of the outer membrane by the vessels of the *raphe*, which, arising from near the *funiculus*, terminate in a broad dark-coloured *chalaza* at the top of the inner coat. The small quadrate embryo is placed at the lower or opposite extremity, close to the apex, which is acute and discoloured.

Plate XLVII. *Fig.* 1, flower and bractea; *fig.* 2, stamen; *fig.* 3, ovarium, style and stigmata; *fig.* 4, transverse section of ovarium, showing the young ovules; *fig.* 5, an ovule; *fig.* 6, a ripe capsule:—all *magnified*.

3. LUZULA, *DeC.*

1. Luzula *crinita*, Hook. fil.; foliis planiusculis crinito-ciliatis, spicis plurimis in capitulum majusculum solitarium sessile late ovatum foliaceum arcte congestis rarius unico pedunculato bractea elongata foliacea subtensis, bracteolis scariosis fimbriato-laceris, perianthii foliolis ovato-lanceolatis coriaceis exterioribus carinatis apicibus subrecurvis, stylo elongato, membrana exteriore seminis fugacea. (Tab. XLVIII.)

Hab. Lord Auckland's group and Campbell's Island; in the former locality found only near the tops of the hills, alt. 1200–1400 feet; more abundant in the latter, from the sea to alt. 1200 feet.

Herba cæspitosa, magnitudine sat varians, summis montibus locisque algidis vix pollicaris, sole sub calidiore 8-pollicaris ad pedalem evadit. *Radix* descendens, perennis, elongata, 1–2 unc. longa, valida, reliquiis copiosis foliorum vetustorum vestita, ubique fibras tenues, elongatas, fasciculatas emittens; sæpius superne pluries divisa, non raro autem simplex vel biceps. *Culmi* plurimi, rarius solitarii, basi præcipue et plus minusve per totam longitudinem foliosi, erecti, stricti, validi, glaberrimi, striati, superne obscure trigoni, ad apices mono-dicephali, plerumque ultra folia extensi, interdum abbreviati foliisque multoties breviores. *Folia* plurima, erecto-patentia, seu omnia v. infima solummodo squarroso-recurva, plantis junioribus planiuscula, demum marginibus plus minusve incurvis involuta, subcoriacea, lineari-subulata, ad apices obtusas incrassata, 3–5 unc. longa, $\frac{1}{6}$–$\frac{1}{4}$ unc. lata, margine pilis elongatis, flexuosis, albidis ciliata et crinita, læte viridia, basi vaginantia, superiora abbreviata, omnia vaginantia; *vaginæ* elongatæ, erectæ, striatæ, integræ; ore obliquo, laxe lanuginoso. *Spicæ* v. potius *paniculæ*, multifloræ, ramis pedunculisque abbreviatis hinc inflorescentia capitata; *capitula* solitaria, terminalia, v. rarius 2, unico pedunculato, late ovata, obtusa, v. globosa, integra v. lobata, $\frac{3}{4}$ unc. longa, atrofusca, opaca, basi lanuginosa, medio 2–3-bracteata, et bractea unica v. bracteis duabus foliaceis, inferne concavis, 1–1$\frac{1}{2}$ unc. longis subtensa. *Flores* parvi, sub 1 lin. longi, numerosissimi, dense conferti, brevissime pedi-

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Plate XLVIII.

Fitch del et lith

prel. lith. Linn. imp.

Luzula crinita Hook. fil.

cellati; pedicelli bracteolati; bracteolæ parvæ, late ovatæ, longe acuminatæ, pilosæ, concavæ, membranaceo-scariosæ, fimbriato-laceræ, laciniis longe piliferis, ultra florem productis. *Perianthii* foliola 3 exteriora lanceolata, longe acuminata, versus apices leniter recurva, concava, superne carinata, coriacea, atro-fusca; interiora breviora, planiuscula, oblongo-lanceolata, acuminata, medio coriacea, rufo-brunnea, marginibus late scariosis, pallidioribus. *Stamina* 6, perianthio $\frac{1}{3}$ breviora; *filamenta* elongata, linearia, compressa; *antheræ* breviusculæ, oblongæ, ad apices brevissime unguiculatæ. *Pollen* stramineum, globosum, immaturum trigonum, hyalinum, nucleo opaco, intus tripartito. *Ovarium* elliptico-ovatum, trigonum, utrinque angustatum, superne in stylum attenuatum, uniloculare, triovulatum; *stylus* ovario brevior, erectus, gracilis, in stigmata 3 inclusa filiformia desinens. *Ovula* 3, e basi loculi erecta, anatropa; funiculis brevibus. *Capsula* perianthio inclusa et subæquilonga, membranacea, obovata, acuta, turgida, trigona, angulis obtusis, unilocularis, trisperma, trivalvis; *valvæ* late obovato-oblongæ, acutæ, concavæ, dorso canaliculatæ, intus medio carinatæ. *Semina* 3, parva, ovoidea, fundo loculi funiculis brevibus adnexa, valvis opposita; membrana exterior laxa, tenuis, hyalina, albida, latere unico ad raphem incrassata, lacera, demum decidua, reliquiis circa chalazam tantum et funiculum persistentibus; interior albumini appressa, brunnea, striata v. reticulata, ad chalazam latam apicemque pendulum atra. *Albumen* carnosum. *Embryo* parvus, ovato-oblongus, teres, funiculo proximus albumine inclusus.

This appears to be a very distinct species, most nearly allied to the *L. Alopecurus*, Desv., of Tierra del Fuego and the Falkland Islands, a plant which Mr. Kunth considers as a form of *L. Peruviana*, Desv., and which much resembles the present in size, general appearance, and in all particulars but the segments of the perianth, which are in *L. Alopecurus* lacerated and fimbriated at the scarious margins, like the *bracteolæ*. It also resembles some states of *L. campestris*, D. C., as that plant appears in Tasmania, but the leaflets of the perianth are nearly scarious throughout in that species, more plane and not so thick and coriaceous; the outer ones are also in this very convex and distinctly carinated above the middle.

PLATE XLVIII. *Fig.* 1, flowers; *fig.* 2, outer leaflet of the perianth; *fig.* 3, inner do.; *fig.* 4, a stamen; *fig.* 5, immature pollen; *fig.* 6, the same more advanced; *fig.* 7, ovarium; *fig.* 8, longitudinal section of the same; *fig.* 9, a ripe capsule; *fig.* 10, seed; *fig.* 11, vertical section of the same:—all *magnified.*

XXIX. RESTIACEÆ, *Br.*

1. GAIMARDIA, *Gaud.*

1. GAIMARDIA *ciliata*, Hook. fil.; dense cæspitosa, foliis erectis undique arcte imbricatis lineari-subulatis obtusis teretiusculis compressis fistulosis basi vaginantibus dorso versus medium marginibusque vaginarum ciliatis, pedunculis fructiferis folio longioribus.

HAB. Lord Auckland's group; exposed places on the hills, very abundant, forming large green patches.

Radix fibrosa; fibris simplicibus, tortuosis, spongiosis, albidis. *Caules* erecti, ramosi, 2–3 unc. longi, dense fastigiatim compacti, foliosi. *Folia* plurima, erecta, cauli appressa, $\frac{1}{3}$ unc. longa, lineari-subulata, gradatim attenuata, apicibus obtusis, teretia, lateraliter compressa, intus fistulosa, dorso ad medium ciliata, basi longe vaginantia, læte viridia, nitida, vetustiora flavo-brunnea; *vaginæ* folio adnatæ, scarioso-membranaceæ, hyalinæ, superne in ligulam brevem, apice rotundatam, integram productæ, marginibus dorsoque ciliatis, pilis elongatis, albidis, articulatis. *Pedunculus* anni præteriti elongatus, validus, erectus, folio longior.—Cætera mihi omnino ignota.

A close examination of this species with the *Gaimardia australis* (Gaudichaud in Freyc. Voy. Bot. p. 418. t. 30), has satisfied me that they are, as far as I can judge without flowers or fruit, congeneric. The habit of the two plants is entirely the same, and both form extended plane hard green tufts on the bare boggy surface of the hills in their respective islands, often of two or three yards across. The present is rather the smaller species, with much smaller leaves, not flattened on the upper surface, ciliated at the back about the middle, as also on the sides and margins of the sheaths, which are produced upwards into a shorter *ligula* than in *G. australis*.

2. Gaimardia *pallida*, Hook. fil.; cæspitosa, ramosa, ramis brevibus fastigiatis compressis, foliis subdistichis equitantibus lanceolato-ensiformibus acuminatis compressis fistulosis basi ad medium vaginantibus, pedunculis brevissimis flores fœmineos 1–3 stamenque unicum gerentibus, fructiferis folio brevioribus, ovario 1–3-loculari, stylis 1–3.

Hab. Campbell's Island; forming small pale-coloured tufts amongst other plants in springy places on the hills.

Radices fibrosæ; *fibræ* simplices, tenues, horizontaliter patentes, spongiosæ, albidæ, sæpe e basibus foliorum v. ramorum ortæ. *Caules* fastigiatim ramosi, 1–1½ unc. longi, cæspites densos, convexos, 2–3 unc. latos formantes, copiose foliosi; *rami* una cum foliis patentibus compressi, ⅓ unc. lati et ejusdem longitudinis. *Folia* arcte imbricata, in ramis ultimis plurima, subdistiche inserta, flabellatim disposita, basi equitantia, deinde erecto-patentia, stricta, lanceolato-ensiformia, acuminata, vix aristata, sub 3 lin. longa, lateraliter compressa, supra obscure concava, basi ad medium et ultra vaginantia, intus fistulosa v. junioribus laxe cellulosa, glaberrima, albida, ad apices immaturaque pallide viridia, textura mollia; *vaginæ* apertæ, membranaceæ, subhyalinæ, obscure reticulatæ, superne gradatim in folium evanidæ. *Flores* valde immaturi tantum mihi visi, inter folia summa omnino occlusi. *Pedunculus* brevissimus terminalis, fructiferus post anthesin elongatus, anni præteriti ramo lateralis, compressus, anceps, foliis brevior. *Glumæ* duæ, flore ⅔ breviores, tenuissime hyalinæ, oblique truncatæ? an a dissectione laceræ? *Stamen* solitarium; *filamentum* crassum, erectum, teres; *anthera* majuscula, ovoidea, unilocularis, rima longitudinali dehiscens, medio dorso affixa. *Ovaria* 2–3 v. rarius plura, distincta v. inter se plus minusve coalita, sessilia? collateralia, 1–3-locularia, stylos tot quot loculos gerentia; nunc ovarium solitarium columniforme abortivum.

The early season in which we visited Campbell's Island was a subject of much regret, as some of the most interesting, especially of the alpine plants, were detected only in a state unfit for satisfactory examination. It is with much hesitation that I have referred the present to *Gaimardia*, in preference to erecting it into a new genus from such imperfect specimens, though I have little doubt but that it will prove to be a new form of that interesting group to which Mr. Brown's genera *Desvauxia* (*Centrolepis*, Lab.) and *Alepyrum* belong, but which have, with the exception of *Gaimardia*, been hitherto considered as confined to Australia. With *Desvauxia* it has much similarity in texture, in the soft leaves, green only towards the extremities, and fistulose, in the simple spongy fibrous roots and glistening appearance of the lower parts of the stem; there is also a marked tendency in this plant to a union of the carpels into one pistil, with as many styles as there are ovaries. In the tufted habit, alpine and antarctic locality, short peduncle and apparent want of spatha, it agrees with *Gaimardia*, but differs from that genus in the solitary stamen, greater number of ovaria which are probably sessile, the latter, however, I am not inclined to consider as a character of much value, as in his description of that genus M. Gaudichaud says, "Ovarium unicum, interdum ovaria duo, altero effœto," and, further, I have gathered capsules of that species which are truly one-celled and dehisce down one side only. In the present plant the ovaria vary from one to three, and are either one, two, or three-celled, frequently there are three together, with as many variations in developement, and not rarely one is reduced to a simple column; at other times all are combined into a single axis. In the imperfect state of these minute organs, in the only specimens I possess, I have found it impossible to decide whether or not two of the upper leaves are analogous to the glumes or spathæ of *Desvauxia*, or whether the two hyaline scales surrounding both stamen and ovaria are the only floral envelopes.

M. Gaudichaud's genus appears to me certainly most nearly allied to the order *Centrolepideæ* or *Desvauxieæ*, and from their near affinity to *Eriocaulon* in all respects but the want of as many floral envelopes, of which several modifications occur in the former group, I have considered them true species of *Restiaceæ* with a reduced number of parts. *G. australis* is described as having the stamens opposite the glumes; I have only examined that plant in the state of ripe fruit, wherein it appears to me that the remains of the filament alternate with the glumes and carpels.

BRANCH OF THE ASIATIC SOCIETY

Fitch del. et lith.

prel. lith. Linn. imp.

Oreobolus pectinatus. Hook. fil.

XXX. CYPERACEÆ, *DeC.*

1. OREOBOLUS, *Br.*

1. Oreobolus *pectinatus*, Hook. fil.; culmis dense cæspitosis ramosis foliosis, foliis distichis equitantibus lineari-subulatis apicibus obtusis rigidis basi vaginantibus, scapo brevissimo terminali unifloro post anthesin elongato, perianthii foliolis ciliatis interioribus utrinque unidentatis. (Tab. XLIX.)

Hab. Lord Auckland's group and Campbell's Island; on the bare and exposed faces of the hills, forming dense convex masses.

Radix fibrosa; *fibræ* elongatæ, 2–3 unc. longæ, validæ, crassitie pennæ passerinæ, teretes, hic illic tortuosæ, suberosæ v. spongiosæ, inferne fibrillosæ. *Caules* densissime cæspitosi, duri, rigidi, ramosi, per totam longitudinem foliosi, plerumque 2 unc. longi sed locis udioribus 4–6 unciales, inferne præcipue radices fibrosas emittentes. *Folia* densissime imbricata, disticha, equitantia, basi vaginantia, flabellatim disposita, lineari-subulata, obtusa, $\frac{1}{2}$–$\frac{3}{4}$ unc. longa, paulo curvata v. ascendentia, supra canaliculata, subtus convexa, medio obscure 1-nervia, basin versus 5–7 nervia, rigide coriacea, crassiuscula, ad margines minute cartilagineo-serrulata, læte viridia, inferiora pallide fusca, vetustiora suberosa, grisea; *vaginæ* laminæ $\frac{1}{3}$ longitudine, ima basi integræ, sinu obtuso, superne hiantes, coriaceæ, ad margines subscariosæ, nervis prominentibus 7–9 costatæ, superne oblique truncatæ, pallide rufo-fuscæ. *Pedunculi* terminales; floriferi brevissimi, post anthesin elongati; fructiferi validi, $\frac{1}{2}$–$\frac{2}{3}$ unc. longi, infra medium turgidi, superne sulcati, obscure angulati, ad apicem a lapsu glumarum cicatricosi. *Glumæ* 2, subæquales, lineari-oblongæ, subacutæ, 2 lin. longæ, coriaceæ, enerves, concavæ, albidæ, convolutæ, superior inferiorem amplectens, deciduæ, florem solitarium includentes. *Perianthium* minimum, sexpartitum v. potius hexaphyllum; *foliola* erecta, ovata, acuta, planiuscula, ad margines ciliata, subenervia, ad medium obscure incrassata, coriacea, subreticulata, persistentia, post anthesin subincrassata, pergamentacea; interiora minora, utrinque obtuse uni-dentata. *Stamina* 3, hypogyna, foliolis perianthii exterioribus opposita; *filamenta* longissime linearia, medio uninervia, longe exserta; *antheræ* lineares, basifixæ, longitudinaliter dehiscentes; connectivo ultra loculos producto, apice obtuso; *pollen* hyalinum, stramineum, tri-tetragonum, angulis obtusis, intus granulis opacis tot quot angulis. *Ovarium* minutum, triquetrum, elongato-obovatum, obtusum, uniloculare, uniovulatum, superne hemisphericum, hispidulum; *ovulum* erectum. *Stylus* elongatus, exsertus, gracilis, teres, erectus, basi modice bulboso-incrassatus, cum ovario articulatus, deciduus, in stigmata 3, æquilonga, filiformia, pilosa productus. *Nux* obovata, obtusa, perianthio persistente basi circumdata, trigona, ad angulos longitudinaliter sulcata, quasi trivalvis, valvis coalitis, extus nitida, intus crustacea, subossea; vertex depressus sub lente granulatus v. subhispidus. *Semen* erectum, loculo conforme, pyriforme, basi subito attenuatum; *funiculus* brevissimus. *Testa* membranacea, pallide viridis; *chalaza* apicalis, orbicularis, fusca; *raphe* tenuis, superne latior, deorsum evanida. *Albumen* copiosum, carnoso-farinaceum. *Embryo* parvus, late obconicus, obtusus, parte superiore solummodo vix et ne vix basi albuminis immersa.

The equitant leaves will at once distinguish this very distinct species from either the Tasmanian *O. pumilio*, Br. or *O. obtusangulus*, Gaud., which are more nearly allied to one another than to the present in appearance.

M. Gaudichaud describes four imbricating scales or glumes in the Falkland Island species; but in this, as in the Tasmanian, there are certainly only two. The six leaflets of the perianth are most probably analogous to the hypogynous setæ in *Scirpus*, and more especially to those organs in *Pterolepis*, in which genus they are flattened; from their great breadth in *Oreobolus* they are seen to belong to two series, a character difficult of detection if it exists where those organs consist of simple slender setæ. The structure of the pericarp is somewhat singular, it is obovate and distinctly trigonous in all the species, the angles are channelled and the three sides much thickened, but the thickening is not continued to the apex, where there is a shallow cavity with a convex base; in a longitudinal section the thickened sides are found to be coriaceous, and have the appearance of three valves united at their margins and to the inner crustaceous pericarp, which they do not altogether enclose, but leave its convex apex free at the

summit. This thickening of the three sides takes place during the growth of the seed-vessel, as in the young ovarium the sides are much narrower than the apex, which is convex and hispid, and which answers to the convex base of the hollow at the top of the ripe nut. I have examined several embryos in all the species, and very many of the present; their structure and form are exceedingly constant, lying in the very bottom of the seed, the broad upper end sunk in a shallow fossa at the base of the *albumen*.

PLATE XLIX. *Fig.* 1, a leaf; *fig.* 2, a flower enclosed in the glumes; *fig.* 3, the same, with the glumes removed; *fig.* 4, a stamen; *fig.* 5, ovarium, style and stigmata; *fig.* 6, immature nut after the style has fallen away; *fig.* 7, a ripe nut enclosed in the persistent perianth; *fig.* 8, longitudinal section of a nut, showing the seed; *fig.* 9, a seed removed, cut vertically, showing the embryo:—all *magnified*.

2. ISOLEPIS, *Br.*

1. ISOLEPIS *Aucklandica*, Hook. fil.; pusilla, dense cæspitosa, culmis erectis setaceis basi divisis foliosis teretibus polyphyllis, foliis culmo subæquilongis semiteretibus superne canaliculatis striatis, spica solitaria laterali, squamis paucis omnibus floriferis, staminibus stigmatibusque 3, nucibus elliptico-ovatis trigonis lævibus pallide stramineis. (TAB. L.)

HAB. Lord Auckland's group and Campbell's Island; in moist places especially near the sea, also amongst grass on the hills, abundant.

Radices cæspites 2–3 unc. latos formantes, fibrosæ, fibris elongatis, creberrime intertextis, tortuosis, fibrillosis, atro-fuscis. *Culmi* plurimi, dense fastigiati; basi crassitie pennæ passerinæ, subelongati, $\frac{1}{2}$ unc. longi, nodosi, ad nodos fibrillosi, vaginis rufo-castaneis foliorum vetustorum obtecti, ter quaterve divisi; superne subvalidi, nudi, erecti, $2\frac{1}{2}$–4-unciales, teretes, striati. *Folia* 2–6, plerumque 3–4, erecta, basi vaginantia, subcoriacea, glaberrima, lævia, filiformia, obtusa v. apice rotundata, culmum plerumque paulo superantia, interdum $\frac{1}{2}$–$\frac{3}{4}$ unc. lata, semiteretia, dorso convexa, supra canaliculata, marginibus subinvolutis v. planiusculis, sub lente lineis alternantibus viridibus albidisque striata. *Vaginæ* $\frac{1}{4}$ unc. longæ, teretiusculæ, compressæ, basi rufo-castaneæ, nitidæ, nervosæ, antice membranaceæ, reticulatæ, ore oblique truncato, integerrimo, ligula nulla. *Spicula* solitaria, v. rarius spiculæ 2, parva, linea vix longior, latiuscula, apice truncata, nempe squamis inferioribus elongatis spicam æquantibus. *Squamæ* paucæ, 6–8, late ovatæ, valde concavæ, coriaceæ, ad margines late membranaceæ, in apicem crassum productæ, dorso superne subincrassatæ, carinatæ, lateribus tenuiter 3–5 nerviis, virides v. castaneo purpureove pictæ, nitidæ. *Stamina* 3; *filamenta* linearia, plana, reticulata, superne latiora; *antheræ* basifixæ, elongatæ, loculis basi apiceque divaricatis. *Ovarium* minimum, ovatum, in stylum rectum desinens. *Stigmata* 3, exserta, elongata, hispida. *Nux* squama paulo brevior, elliptica, utrinque acuta, trigona, compressa, angulis obtusis, glaberrima, lævis, non polita, pallide flava v. straminea.

It is not before the most careful examination and comparison of this with many other similar species from various parts of the world, that I have decided upon describing it as new. Nor could I make it agree with the description of any of the numerous species of the southern hemisphere. It appears not only to differ from the European, but also from the twelve or fourteen plants belonging to this genus now known to inhabit Australia and New Zealand. In habit and appearance it resembles *I. setacea*, L. and *I. Savii*, from which it differs in the leaves being always more numerous and as long or longer than the culm, in the shorter spikes, and more materially in the seed, which is twice as large as in those species and of quite a different shape, being elliptical-ovate, compressed, trigonous with the angles rounded, the surface is smooth but not shining and the colour pale yellow. My suite of specimens is very extensive, and these characters are constant in them all. The breadth of the leaves is greater in the upland specimens than in those of the sea-coast.

PLATE L. *Fig.* 1, apex of the culm and spikelet; *fig.* 2, a scale and flower; *fig.* 3, a stamen; *fig.* 4 and *fig.* 5, ripe achænia:—all *magnified*.

BOTANY BRANCH OF THE STATE

Fitch del et lith.

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Isolepis Aucklandica. Hook. fil.

3. CAREX, *Mich.*

1. Carex *ternaria*, Forst.; spicis 9–10 cylindraceis acutis pedunculatis alternis evaginatis ferrugineis longissime foliaceo-bracteatis simplicibus geminatisque, masculis 3–4 remotiusculis, fœmineis 5–6 geminatis unica solum simplici, stigmatibus 2, perigyniis (*peradolescentibus*) oblongis ore integro squama lanceolata acuta v. obtusa ferruginea longe hispido-aristata multoties brevioribus. *Boott, MSS.* C. ternaria, *Sol. MSS., Forst. Prodr.* no. 549. C. geminata, *Schkuhr, Caric.* p. 83. no. 54. *Tab. W. & P.* p. *A. Cunn. Prodr. Flor. Nov. Zel. in Hook. Comp. to Bot. Mag.* v. 2. p. 373.

Hab. Lord Auckland's group; on the margins of woods near the sea, but not common, growing with the *C. trifida.*

Culmus bipedalis et ultra, basi foliorum rudimentis purpureis lanceolatis, ad margines lacerato-reticulatis tectus, firmus, apice gracilis, triqueter, scaber; pars spicas gerens pedalis. *Folia* 3–4 lin. lata, culmo longiora, carina marginibusque scabra. *Bracteæ* foliaceæ, longissimæ, evaginatæ, superiores setaceæ, spicis suis (nisi 2 supremis masculis) longiores. *Spicæ* 2–2½ poll. longæ, 1½–2 lin. latæ, alternæ; supremæ 3–4 masculæ, simplices; reliquæ fœmineæ, 2 superiores geminatæ, inferior simplex; vel infima superioresque geminatæ, una media simplex. *Pedunculi* triquetri, scabri, 1–2 poll. longi. *Squamæ* ferrugineæ, obtusæ v. acutæ, nervo viridi in aristam plus minus longam serratam producto. *Perigynium* immaturum.—*Boott.*

For the above description I am indebted to Dr. Boott, who has most kindly given me the aid of his great skill and experience in determining such species of this fine genus as were collected during the voyage. With his sanction I have retained Banks and Solander's manuscript name of this plant, as adopted by Forster in his Prodromus, and which was changed by Schkuhr into *geminata*, certainly without sufficient authority, and of which he says, "Cette plante me parvint sous le nom de *C. ternaria*, mais ne trouvant rien en elle qui ait quelque rapport avec ce nom, je me suis cru fondé a douter que ce soit la plante que *Forster* indique," &c. M. Schkuhr's specimens seem to have been in a very imperfect state, but given him from Forster's herbarium. Our own entirely agree with those preserved in the British Museum. It appears to be rather a common plant in many parts of New Zealand.

2. Carex *trifida*, Cav.; spicis 6–10 oblongo-cylindraceis obtusis alternis breviter vaginatis ferrugineis longissime foliaceo-bracteatis solitariis, masculis 2–4 sessilibus approximatis, fœmineis 5–6 breviter pedunculatis, stigmatibus 3, squamis lineari-oblongis integris v. apice trifidis segmento intermedio in aristam subulatam hispidam producto, perigyniis pedicellatis obovato-oblongis longe rostratis, rostro bidentato. C. trifida, *Cavanilles Icones*, vol. v. p. 41. t. 465. *Brong. Voy. de la Coquille, Bot. Phan.* p. 158. *Willd. Sp. Pl.* v. 4. p. 301. *Spr. Syst. Veg.* v. 3. p. 829. C. incrassata, *Banks and Sol. MSS. in Bibl. Banks.* C. aristata, *D'Urv. Fl. Ins. Mal. in Trans. Linn. Soc. Paris*, vol. iv. p. 599. *Gaud. in Freyc. Voy. Bot.* p. 131.

Hab. Lord Auckland's group and Campbell's Island; by the margins of the woods near the sea in moist places.

Rhizomata densissime congesta et intertexta, cæspites convexos, supra terram elatos, 1–2 pedales diametr. formantia, crassitudine pollicis humanæ, inclinata v. prostrata, fusca, fibras crassas, diametr. pennæ anatinæ demittentia, et in fibras subsimiles desinentia. *Culmi* 15–30 v. plures, fasciculati, erecti, 2–4 pedales, copiosissime foliosi, glaberrimi, basi crassi, una cum vaginis foliorum ¾–1 unc. diametr., triquetri, reliquiis pallidis vaginisque scariosis sæpe laceris foliorum vetustorum obtecti, superne graciles, inclinati, pars spicas gerens 1–1½ pedalis. *Folia* plurima, circiter 12–20 quovis culmo, longe vaginantia, valdè elongata, culmum longe superantia, 3–5 pedalia, diffusa, flexuosa, supra medium curvata et pendula, gradatim in apicem trigonum filiformem hispidum producta, profunde striata, rigida, læte viridia, subtus pallidiora, subglaucescentia, ad costam subtus prominentem marginesque recurvas scabrido-ciliata, inferne carinata, superne medio per totam longitudinem canaliculata. *Vaginæ* foliorum inferiorum

2–4 pollicares, superiorum pedales, trigonæ v. compressæ, dorso coriaceæ, carinatæ, rigidæ, nervosæ, profunde striatæ, antice scariosæ, hyalinæ, albidæ; ore integro, abrupto, margine undulato; ligula angusta, conica, integerrima. *Bracteæ* foliaceæ, folia superiora omnino simulantes sed minores, spicis multoties longiores, vaginis abbreviatis. *Spicæ* 2–4-unciales, 3–5 lin. latæ, late cylindraceæ v. elongato-ovatæ v. oblongæ, obtusæ v. subacutæ, basi sæpius attenuatæ, aristis elongatis squamarum quasi crinitæ, inferiores rarius bifidæ, v. spicula abbreviata subtensæ; masculæ supremæ, 2–4, approximatæ, cæteris breviores, medio sæpius turgidæ, breviter pedicellatæ v. subsessiles, basi brevissime vaginatæ; bractea abbreviata, spica brevior, torta; *fœmineæ* longiores, longius pedicellatæ, fructiferæ squarrosæ. *Pedunculi* breviter exserti, sub ½ unciales, trigoni, striati, scaberuli, sæpe apices versus flexuosi. *Squamæ* scariosæ, forma variæ, lineari- v. oblongo-lanceolatæ, 3–4 lin. longæ, planiusculæ, erectæ, floriferæ appressæ, fructiferæ squarroso-subrecurvæ, omnes striatæ, castaneo-brunneæ, nitidæ, linea pallida medio notatæ, ad apices integræ, in aristam æquilongam vel ter longiorem productæ, vel sæpius trifidæ, segmento intermedio elongato aristæformi; arista straminea, erecta, flexuosa, hispida, interdum ⅓ unc. longa. *Stamina* 3; *antheræ* lineares, stramineæ, 2–3 lin. longæ. *Perigynium* immaturum elliptico-ovatum, utrinque attenuatum, pedicellatum, squama ⅓ brevius, valde compressum, dorso convexum, ore bifido: *stylus* 1, una cum stigmatibus 3 perigynio æquilongus. *Fructus* (exemplaribus Americanis tantum mihi visus), majusculus, squamæ subæquilongus, elongato-obovatus v. obovato-oblongus, turgidus, sublonge pedicellatus, obscure trigonus, superne rostratus, ad apicem bidentatus, fulvus, nitidus. *Achænium* parvum, perigynio duplo brevius, obovato-ellipticum, utrinque obtusum, glaberrimum, angulis acutis, luride fuscum. *Pericarpium* crustaceum. *Embryo* basi albuminis totus inclusus.

This is a very handsome species, discovered by Sir Joseph Banks and Dr. Solander in New Zealand, though first described from Falkland Island specimens by Cavanilles. In Antarctic America it is more abundant, and attains a larger size than it does in Lord Auckland's group, but I can detect no further difference between them; Dr. Boott also considers them entirely the same. In Cavanilles' figure the scales are represented as shorter and more abruptly truncated than they are in most of my specimens; they, however, vary so much in form that little dependence can be placed upon that character. M. D'Urville, in his Flor. Ins. Mal. l. c., describes this species under the name of *C. aristata* and says of it, "forsan eadem species ac *C. trifida*, Cav.? verum in nostra nunquam squamam trifidam vidi." Cavanilles' character, however, "gluma apice trifida, laciniis lateralibus latioribus, media breviore ex qua arista prodit subulata," &c., seems to me sufficiently to accord with this and M. D'Urville's plant, whilst his characteristic figure leaves no doubt of their identity, or at least of the latter being a variety with all the scales short, in our plant it is only on the lower part of the spikes that they are so broad. The *embryo* appears to me wholly included in the base of the albumen.

3. Carex *appressa*, Br.; spica decomposita androgyna subelongata, partialibus appressis inferioribus distinctis, spiculis parvis ovatis acutis apice masculis, bracteis subulatis spicula brevioribus elongatisve, squamis ovatis acutis concavis, perigyniis late ovato-rotundatis infra orem minute bidentatum attenuatis utrinque nervosis marginibus supra medium denticulatis, stigmatibus 3. C. appressa, *Brown, Prodr.* p. 242.

Hab. Lord Auckland's group and Campbell's Islands; in the woods especially near the sea, forming large harsh tufts.

Rhizomata intertexta, dense fasciculata, cæspites 5–6 uncias latos formantia, repentia, crassiuscula, diametr. pennæ corvinæ, hic illic fibrosa, ad collum reliquiis foliorum vetustorum obtecta. *Culmi* erecti, exteriores inclinati, ascendentes, basi una cum vaginis foliorum crassit. digiti minoris, pedales et infra, superne nudi, paulo inclinati, scaberuli, sulcati, rigidi, triquetri, ad angulos scabridi; pars spicas gerens 3–5-uncialis, stricta. *Folia* plurima, 8–10 quovis culmo, basi vaginantia, flexuosa, rigida, dura, 2–3 pedalia, ½ unc. lata, in apicem elongatum, trigonum, scabridum producta, medio canaliculata, subtus præcipue profunde striata, acute carinata, carina marginibusque lente recurvis denticulato-ciliatis, pallide viridia, subnitida, subtus pallidiora. *Vaginæ* 1–2-unciales, obtuse trigonæ, compressæ, profunde striatæ, coriaceæ, antice scariosæ, integræ; ore integerrimo, truncato; ligula angusta,

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Fitch del et lith.

Uncinia Hookeri. Boott.

scariosa, horizontalis, vix lineam longa. *Inflorescentia* subpaniculata, e spicis plurimis compositis formata, in paniculam linearem, elongatam, coarctatam, ¼ unc. latam, interruptam disposita. *Spicæ* partiales muticæ, ¼–⅜ unc. longæ, breviter pedicellatæ, rachi appressæ, lineari-oblongæ, compressæ, spiculas 5–10 gerentes, basi nudæ v. bracteatæ, evaginatæ. *Bractea* dum adsit spica partiali brevior v. æquilonga, subulata, hispida, basi latior, semiamplexicaulis, scariosa, interdum ad squamam elongatam, aristatam, vacuam redacta. *Spiculæ* parvæ, ovatæ v. oblongæ, obtusæ, cylindraceæ v. paulo compressæ, androgynæ, squamis superioribus masculis. *Squamæ* appressæ, fructiferæ squarroso-patentes, late ovatæ, subacutæ v. obtusæ, valde concavæ, scariosæ, medio coriaceæ, dorso obscure carinatæ, carina plerumque superne ciliata, 1½ lin. longæ, pallide flavo-brunneæ, nitidæ, medio linea straminea notatæ. *Stamina* 3; *antheræ* lineares, parvæ. *Perigynium* immaturum breviter pedicellatum, elliptico-oblongum, utrinque attenuatum, valde compressum, nervosum, ad margines supra medium argute denticulatum, dorso convexiusculum, nervo utrinque minute scabrido. *Ovarium* parvum, obovatum, ad apicem profunde emarginatum. *Stylus* vix exsertus, in stigmata 3 desinens. *Fructus* squamam paulo superans, nervis plurimis costatus, late orbicularis v. ampullaceus, basi subcordatus, breviter pedicellatus, superne in rostrum subelongatum apice bidentatum attenuatus, antice planus v. concavus, dorso convexus v. turgidus, pallide fuscus v. atro-fuscus, subnitidus, achænio appressus, marginibus supra medium utrinque serratis. *Achænium* late elliptico-ovatum, utrinque attenuatum, subinduratum.

A frequent inhabitant of the woods in some parts of Tasmania, New Holland, and New Zealand; of a rigid harsh texture, cutting the hand when incautiously grasped.

4. UNCINIA, *Pers.*

1. Uncinia *Hookeri*, Boott; spica ferruginea laxiflora tenui cylindracea apice mascula, stigmatibus 3, perigyniis (arista pallida duplo brevioribus) lanceolatis ore integro lævibus nervosis alternatim contiguis squama lanceolata acuminata acuta ferruginea nervo viridi infra apicem evanescente brevioribus.—*Boott, MSS.* (Tab. LI.)

Hab. Lord Auckland's group and Campbell's Island; grassy places in the woods, also on the rocks at the tops of the hills.

Radix stolonifera. *Culmus* 6-pollicaris (anni prioris marcidus pedalis), filiformis, lævis, basi foliatus vaginisque ferrugineis striatis tectus. *Folia* plana, ½–1 lin. lata, culmo subduplo longiora, carinata, apice triquetra, scabra; in exemplaribus minoribus vix tripollicaribus, locis siccis natis folia rigida curvata. *Spica* 17 lin. longa, 1½ lin. lata, ferruginea, laxiflora, e floribus laxis, alternatim contiguis, pars tertia suprema mascula, nuda v. rarius setaceo-bracteata. *Squamæ* omnes conformes, lanceolatæ, elongatæ, acuminatæ, acutæ, nervo viridi, infra apicem albo-hyalinum evanescente, perigyniis (floriferis) paululum longiores. *Perigynium* (floriferum) 2½ lin. longum (cum arista et stipite 4½ lin. longum) ½ lin. latum, lanceolatum, utrinque attenuatum, pallidum, nervosum, ore integro, stipitatum. *Achænium* immaturum. *Stigmata* 3, longe plumosa, ferruginea.—*Boott.*

Plate LI. *Fig.* 1, a male flower and scale; *fig.* 2, pollen; *fig.* 3, a female flower and scale; *fig.* 4, the same removed from the scale with the perianth laid open; *fig.* 5, ovarium, style and stigmata; *fig.* 6, arista:—all *magnified.*

XXXI. GRAMINEÆ, *Juss.*

Tribe AVENACEÆ, *Kunth.*

1. HIEROCHLOE, *Gmel.*

1. Hierochloe *redolens*, Br.; panicula effusa subnutante, glumarum valvis flosculis subæquilongis interiore trinervi nervis 2 lateralibus ad medium attingentibus, flosculis masculis 5-nerviis pubescentibus

basi sub barbatis infra apices truncatas aristatis marginibus longe dorsoque ciliatis, hermaphrodito obtuso apice mucronato v. subaristato, foliis planis glabriusculis, ligulis late ovatis obtusis. H. redolens, *Brown, Prodr.* p. 209 (in observat.). *Kunth Agrost.* p. 37 (in part.). H. Banksiana, *Endl. Bemerkungen über die Flora der Südseeinseln,* p. 156. no. 549. Holcus redolens, *Sol. MSS. et Forst. Prodr.* no. 563. *non Vahl.* Torresia redolens, *Roem. et Schultes,* vol. ii. p. 516. *A. Cunn. Prodr. Flor. Nov. Zel. in Hook. Comp. Bot. Mag.* vol. ii. p. 372.

HAB. Campbell's Island; in marshy places near the sea; rare, not observed in Lord Auckland's group.

Gramen perenne, plerumque elatum tri-quadripedale, in Insula Campbell vix bipedale, cæspitosum, odore suavi. *Radices* fasciculatæ, intertextæ, fibrosæ; fibris elongatis, 1–2-uncialibus, crassiusculis, crassitie pennæ passerinæ, descendentibus, duris, albidis, hic illic fibrillosis. *Culmi* basi plus minusve elongati, inclinati v. prostrati, diametr. pennæ corvinæ et ultra, rarius divisi, nodosi, cylindracei, ad nodos fibrillosi, superne vaginis scariosis obtecti, internodiis sub $\frac{1}{2}$ uncialibus, superne ascendentes, rarius erecti, basi compressi, foliosi, una cum foliis $\frac{1}{4}$ unc. diametr., profunde striati, læves, nitidi, pallide virides, siccitate flavi, remote nodosi, ad nodos subgeniculati, nodis constrictis, fusco-brunneis, opacis, internodiis $\frac{1}{2}$–2-uncialibus, superioribus 5–8 unc. longis. *Folia* plurima, culmo subæquilonga, basi longe vaginantia, infima stricta, abbreviata, superiora elongata, 1–2 pedalia, sub $\frac{1}{3}$ unc. lata, erecto-patentia, demum flexuosa, plana, superne involuta, herbacea, v. subcoriacea, profunde striata, superne glaberrima, lævia v. sub lente minutissime scaberula, nitida, læte viridia, subtus glaucescentia scabriuscula. *Vaginæ* 3–7 unc. longæ, compressæ, ad basin fissæ, profunde striatæ, glaberrimæ, nitidæ, virides, rubro-purpureo pictæ, ad margines scariosæ, inferiores latiores, hiantes, basi purpurascentes, vernicosæ; ligula late ovata, obtusa, scariosa, integra v. lacera. *Panicula* gracilis, elongata, inclinata v. nutans, effusa, 6–10 unc. longa, sub 2 unc. lata, pallide flavo-fusca, nitida; rachi striata, glaberrima; ramis elongatis, gracillimis, angulatis, hic illic parce pilosis, inferioribus 2–4 unc. longis, nutantibus. *Spiculæ* pedicellatæ, pedicellis spicula $\frac{2}{3}$ brevioribus, pilosis. *Gluma* bivalvis, membranaceo-scariosa, glaberrima, nitida; *valvæ* subæquales flosculis paulo longiores v. æquilongæ, 2–3 lin. longæ, acuminatæ, nervo medio tenui, dorso subdenticulato; *inferior* uninervis v. rarissime basi nervis duobus lateralibus brevissimis; *superior* trinervis, nervis lateralibus medium vix attingentibus, inconspicuis, viridibus. *Flosculus* inferior subsessilis, intermedius terminalisque pedicellati. FLOSCULI LATERALES.—*Palea inferior* ovato-oblonga, superne subtruncata, emarginata v. bifida, dorso aristata, quinquenervis, v. inæquilateralis et sexnervis, ad nervos angulata, inferne ciliato-subbarbata, superne pubescens v. pilosa, dorso brevissime ad marginesque longe sericeo-ciliata, ciliis marginum rectis v. paulo curvatis; *arista* erecta, infra apicem inserta, gluma breviore, scabrida: *Palea superior* inferiore paulo brevior, lineari-oblonga, bifida, bicarinata, carinis extus ciliatis. *Stamina* 3; *filamentis* breviusculis; *antheris* elongatis, stramineis. FLOSCULUS TERMINALIS V. INTERMEDIUS lateralibus $\frac{1}{3}$ minor. *Palea* inferior ut in flosculis lateralibus sed plerumque glaberrima, apice tantum puberula et dorso versus apicem ciliata; *arista* brevi, infra apicem inserta, hispida. *Palea superior* lineari-oblonga, concava, apice truncata, medio uninervis, v. rarius nervis duobus, apice extus nervoque dorso pubescentibus. *Squamulæ* 2, ovato-lanceolatæ, acuminatæ. *Stamina* 2; *filamentis* brevibus; *antheris* parvis. *Ovarium* oblongo-lanceolatum, utrinque attenuatum. *Styli* basi contigui, palea bis longiores. *Caryopsis* parva, cylindracea.

The above described plant is very nearly allied both to the *Hierochloe antarctica,* Br., and to the *H. Magellanica,* Pal. de Beauv., if indeed these three be truly distinct. When describing the first of them, Mr. Brown remarks, "huic quam maxime affinis est Holcus *redolens,* Forst:" and he draws the chief distinction from the inner glume of the latter being three-nerved and the ciliæ on the margin of its lower florets being curved. In the Tasmanian specimens of *H. antarctica,* which I have examined, I find that the upper glume is often furnished with two short lateral nerves at the base, and in the New Zealand species (*H. redolens*) the ciliæ alluded to are as often straight as curved. Perhaps a more constant character between the plants of these two countries exists in the surface of the leaves of the *H. antarctica* being decidedly scabrid, not only to the touch but under a moderate magnifying power, its florets also are not so abruptly truncated; I have not been able to detect any other points of difference. The South

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Hierochloe Brunonis. Hook: fil:

prel: lith: Linn: imp.

American plant again, which is the *Holcus redolens*, Vahl, (not of Forster), is considered by A. Brongniart as a variety (*redolens*) of the *Hierochloe antarctica*, Br. (Voy. de la Coquille, Bot. Phan. p. 144. t. 23.), and he quotes Raspail (Ann. Sc. Obs. vol. ii. p. 83.) in confirmation of his views; it certainly differs but slightly from the plant of the Old World, and chiefly in the longer ciliæ at the back of the lower florets, in having the glumes three-nerved, the panicle more contracted, and rather larger glumes. The leaves are generally quite smooth and glossy, the under surface only obscurely scabrid.

Besides the above mentioned species there are four more very distinct ones in the Southern Hemisphere, (as well as three natives of the Cape of Good Hope); one, the *H. Brunonis*, mihi (vid. infra), from Lord Auckland's group; another, the *H. utriculata*, Kunth, a native of Chili; and two hitherto undescribed species. The first of these is from Australia, *H. rariflora*, mihi*, and was discovered by Mr. Baxter in King George's Sound; it may readily be distinguished by its slender culms, branching upwards, and its narrow scabrid leaves, loose few-flowered panicle and small locustæ. The other, *H. Fraseri*, MS., will be described in the Flora of Tasmania; it is the smallest of any of the southern species, and has a more coarctate panicle of small locustæ, resembling that of *H. australis*, R. and S.; the florets themselves are marked with purple as in *H. pauciflora*, Br., the glumes are large, broad and three-nerved, the lower palea silky, acute, with a short awn, the leaves are mnch shorter than the culm.

Mr. Brown's remarks upon the structure of the florets of this genus, in the 'Plantæ rariores Javanicæ' are very important (vid. fasc. 1. p. 8. sub genere *Ataxia*), especially regarding the nature of the upper palea of the middle flower. I have described that organ as sometimes two-nerved in *H. redolens*, which is a strong argument in favour of that author's assumption that "the median nerve is here formed of two confluent cords," and hence that the real nature of the upper palea is the same as in other genera of grasses. Where I observed two nerves to exist, both were rather faint, but distinctly scabrid on the back. The frequently emarginate or bifid apex of this palea in the other species of the genus, where I have not seen a double nerve, is also worthy of remark.

The *Hierochloe redolens* is a scarce plant in Campbell's Island and of stunted growth; it was not observed in Lord Auckland's group.

2. HIEROCHLOE *Brunonis*, Hook, fil.; panicula ovata subeffusa nutante, glumarum valvis æqualibus flosculis longioribus lanceolatis acuminatis basi trinerviis nervis lateralibus brevibus, flosculis masculis 5-nerviis pubescentibus basi pilosis superne bifidis inter segmenta acuta aristatis dorso scabridis marginibus breviter ciliatis, hermaphrodito apicem versus integrum breviter aristatum piloso, foliis involutis glaberrimis, ligulis late ovatis scariosis. (TAB. LII.)

HAB. Lord Auckland's group and Campbell's Island; in the former islands growing towards the tops of the mountains, alt. 1000–1400 ft.; abundant near the sea in the latter.

Gramen pulchrum, suaviter odorum, 1–1½ pedale. *Radix* fibrosa, fibris tenuibus, elongatis, fibrillosis. *Culmi* parce cæspitosi, basi inclinati, lignosi, crassitie pennæ corvinæ, reliquiis pallidis fibrosis foliorum vetustorum obsiti, ad collum sæpe bis terve divisi et surculos nodosos ad nodos radicantes emittentes, superne erecti, graciles, curvati, foliosi, striati, una cum vaginis foliorum ⅓ unc. diametr., remote nodosi, nodis constrictis, flavo-fuscis. *Folia* subdistiche inserta, suberecta, stricta v. paulo curvata, ¾–1 ped. longa, longe lineari-subulata, gradatim attenuata, imo apice acuta, involuta, subcoriacea, extus lævia v. obscure striata, glaberrima, nitida, straminea, intus profunde striata, opaca, sub lente scaberula, pallide viridia. *Vaginæ* erectæ, subcompressæ, culmo appressæ, latiusculæ, usque ad

* HIEROCHLOE *rariflora*, Hook. fil.; panicula laxa effusa pauciflorâ, glumarum valvis inæqualibus flosculis ½ brevioribus, palea inferiore obtusa, arista nulla, flosculi intermedii palea superiore apice bifida ciliata, foliis anguste linearibus scabridis, culmis elongatis basi ramosis foliosis.

HAB. Australia. King George's Sound, *Baxter*.

basin fissæ, foliorum inferiorum 1–1½ unc. longæ, coriaceæ, sulcatæ, politæ, nitidæ, pallide stramineæ; foliorum superiorum elongatæ, teretes, profunde striatæ, ad collum subincrassatæ; *ligula* scariosa, late ovata, obtusa, fimbriato-lacera. *Panicula* nutans, ramosa, 4–5 unc. longa, ovato-lanceolata, 1½ unc. lata, multiflora; rachi gracili, curvato, tereti, lævi; ramis hic illic subverticillatis, gracillimis, flexuosis, inferioribus uncialibus, suberectis. *Spiculæ* obovato-oblongæ, ⅓ unc. longæ, pedicellatæ, pedicello sparse piloso. *Gluma* bivalvis; valvæ æquales, scarioso-membranaceæ, flosculis ½ longiores, lanceolatæ, longe acuminatæ, dorso convexæ, glaberrimæ, micantes, marginibus versus apices sæpe laceris, nervo medio tenui, vix scaberulo, duobus lateralibus infra medium evanidis, viridibus. *Flosculi* straminei, fusco-purpureo picti, breviter pedicellati, pedicello nudo v. obscure ciliato. FLORUM MASCULORUM *palea inferior* late ovato-oblonga, concava, quinquenervis, subsericea, apicem versus pilosa, superne bifida, inter segmenta acuta aristata, dorso sub arista ciliata, basin versus fere nuda, ad marginem pilis subcurvatis breviusculis ciliata; *arista* scabrida, recta v. subtorta, ultra glumas vix producta: *palea superior* inferiori subæquilonga, oblonga, apice bifida, binervis, bicarinata, carinis ciliatis. *Stamina* 3; *filamentis* elongatis; *antheris* exsertis, stramineis. FLOSCULI HERMAPHRODITI *palea inferior* ut in fl. masc. sed glabrior, superne tantummodo pilosa, ad apicem subacuta, in aristam brevem setiformem producta, dorso superne ciliata, marginibus nudis: *palea superior* lineari-oblonga, concava, infra apicem emarginatum subpubescens, nervo medio tenui extus scaberulo. *Squamulæ* 2, ovatæ, acuminatæ. *Stamina* 2; *antheris* minoribus quam in fl. masc. *Ovarium* ellipticum, utrinque attenuatum. *Styli* 2, basi approximati; *stigmatibus* plumosis. *Caryopsis* non visa.

This is a handsome and very distinct plant, with more the habit of growth of the European species than of the larger and more leafy *H. redolens* or *antarctica*. It is very abundant in some parts of the islands now under consideration, always growing in exposed situations, where its graceful habit and nodding panicles are a great ornament to the dreary regions it inhabits.

PLATE LII. *Fig.* 1, spikelet; *fig.* 2, florets removed from the same; *fig.* 3, a male floret; *fig.* 4, a hermaphrodite floret; *fig.* 5, upper palea from the same; *fig.* 6, squamula; *fig.* 7, ovarium, styles and stigmata from the same:—all *magnified*.

Tribe AGROSTIDEÆ, *Kunth.*

2. AGROSTIS, *L.*

§. I. *Floris superioris rudimenta nulla.*

1. AGROSTIS *leptostachys*, Hook. fil.; panicula gracillima effusa pauciflora, ramis elongatis versus apices floriferis, glumarum valvis æquilongis lineari-lanceolatis marginibus superne carinisque ciliatis flosculum sessile longe superantibus, palea inferiore late ovata basi nuda apice truncata quadrifida dorso pilosa infra medium aristata, arista glumas superante, palea superiore nulla (an minima?), setula nulla.

HAB. Campbell's Island; growing amongst tufts of other plants near the sea, scarce.

Radix fibrosa. *Culmi* graciles, erecti, foliosi, 6–8 unc. longi. *Folia* longe vaginantia, erecto-patentia, 5–7 unc. longa, planiuscula, demum involuta, anguste linearia, 1–2 lin. lata, striata, sub lente scabriuscula, luride viridia, opaca. *Vaginæ* 2–3 unc. longæ, cylindraceæ, diametr. pennæ corvinæ, usque ad basin fissæ, profunde striatæ, scabriusculæ, pallide virides v. stramineæ, ore contracto; *ligula* elongato-oblonga, truncata, scariosa, lacera. *Panicula* effusa, sub 3 unc. longa, parce ramosa; rachi ramisque capillaribus, sub lente scabridis. *Spiculæ* pedicellatæ, pedicello gluma sub ½ breviore, superne incrassato, sulcato. *Glumarum* valvæ ¼ unc. longæ, flosculum inclusum subduplo longiores et ultra, lineari-lanceolatæ, dorso acute carinatæ, carina argute ciliato-denticulata, viridi. *Flosculus* brevissime pedicellatus, pedicello glaberrimo. *Palea* late ovato-oblonga, sparse pilosa, apice truncata, 4-dentata, quinquenervis nervo medio infra medium in aristam desinente; *arista* glumam subæquante, gracili, scabrida, basi curvata v. geniculata.

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Agrostis subulata Hook. fil.

Of this grass I have only seen immature specimens, with the panicle, however, fully formed; it is very distinct from any species with which I am acquainted, certainly wanting the rudimentary setula of the second flower, and, as far as I can observe, the upper palea also. Its habit and general appearance are decidedly those of *A. Billardieri*, Br. and *A. æmula*, Br., plants which have been removed not only from this genus, but into a separate division of the Natural Order (*Arundinaceæ*) as it is now divided. These, with several other Australian and New Zealand species appear to form a very natural group, though they vary in the presence or absence of the upper palea, of the setula, of the awn, and of a bearded pedicel to the flower; neither the genus *Lachnagrostis* (founded by Trinius) as defined by Nees (Act. Acad. Cæs. Leop., &c., vol. xix. Suppl. p. 146), nor *Deyeuxia*, Clar., as adopted by Kunth (Agrost., p. 239.), will include these species. Under whatever genus they may rank, their affinity appears to me to be near *Agrostis*, L. and not with *Calamagrostis*, Adans. and *Arundo*, L.

2. Agrostis *multicaulis*, Hook. fil.; panicula contracta lineari-oblonga, glumarum valvis æquilongis obscure pilosis dorso denticulatis flosculo sessili glaberrimo bis longioribus, palea inferiore late ovata apice truncata quadrifida quinquenervi nervo dorsali ad medium in aristam elongatam producta, superiore $\frac{1}{3}$ breviore ovata obtusa, setula nulla, foliis substrictis lineari-subulatis, culmis basi pluries divisis.

Hab. Campbell's Island; on the sloping faces of the hills in the most exposed parts of the island, not common.

Radix fibrosa. *Culmi* fasciculati, 5–7 unc. longi, validi, basi horizontales v. subrepentes, nodosi, ad nodos fibrosi, sæpe geniculati, crassitie pennæ anatinæ, ramosi, superne erecti, simplices, remote nodosi, foliosi. *Folia* plurima, longius vaginantia, 2–3 unc. longa, lineari-lanceolata v. subulata, concava, superne involuta, striata, utrinque scabrida, luride viridia, opaca. *Vaginæ* elongatæ, 1–2 unc. longæ, ad basin fissæ, utrinque contractæ, foliorum supremorum medio turgidæ, sulcatæ, pallide virides, ore contracto; *ligula* ovato-oblonga, scariosa, apice truncata, lacera. *Panicula* coarctata, sub $1\frac{1}{2}$ unc. longa, lineari-oblonga; rachi ramisque validis, scabridis. *Spiculæ* pedicellatæ; pedicello breviusculo, infra florem incrassato. *Glumarum valvæ* 2 lin. longæ, lanceolatæ, acuminatæ, obscure scabriusculæ, dorso ciliato-dentatæ, marginibus superne subdenticulatis. *Flosculus* sessilis, basi nudus. *Palea inferior* gluma $\frac{1}{2}$ brevior, glaberrima, late ovata, concava, superne truncata, quadridentata, dentibus erosis, quinquenervis, nervo dorsali ad medium in aristam tenuem scabridam glumas superantem producta; *palea superior* inferiore $\frac{2}{3}$ brevior, oblonga v. ovato-oblonga, apice rotundata. *Stamina* 3; *filamentis* brevibus; *antheris* late oblongis, stramineis. *Caryopsis* lineari-oblonga, utrinque attenuata.

This is not an uncommon grass at the bases of precipices and on the exposed slopes of the island. It is remarkable for being nearly allied to a species brought by Dr. Jameson from the extreme verge of vegetation on Pichincha in Colombia, the *A. foliata* *, mihi; that species is, however, more leafy and its whole culm is enclosed in the sheathing vaginæ.

3. Agrostis *subulata*, Hook. fil.; parva, cæspitosa, panicula erecta pauciflora, glumarum valvis ovato-lanceolatis parce pilosis, dorso marginibusque supra medium scabrido-ciliatis flosculo glaberrimo subsessili

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* Agrostis *foliata*, Hook. fil.; panicula contracta compressa oblonga obtusa densiflora, glumarum valvis æquilongis glaberrimis viridi-purpureis dorso ciliatis, flosculo sessili, palea inferiore glaberrima apice 4-dentata 5-nervi, nervo medio in aristam validam elongatam glumas superantem producta, superiore minima hyalina, foliis longe vaginantibus lanceolatis planis utrinque scaberulis, vaginis compressis lamina bis longioribus turgidis sulcatis glaberrimis, culmis valde foliosis basi compressis validis.

Hab. Colombia; on Pichincha at the limits of perpetual snow, alt. 15,676 ft.—*Prof. W. Jameson.*

duplo longioribus, palea inferiore late obovato-oblonga superne truncata 4–5-dentata quinquenervi nervo medio apicem attingente v. supra medium in aristam muticam producto, inferiore minima squamæformi (an nulla?), foliis plurimis glaberrimis setaceo-filiformibus culmo brevioribus. (Tab. LIII.)

Hab. Campbell's Island; on elevated and exposed rocks at the highest summits of the mountains.

Radix fibrosa. *Culmi* cæspitosi, basi interdum inclinati, stricti v. curvati, sæpius divisi, 1–2 unc. longi, bis terve nodosi, copiose foliosi, una cum foliis 3 lin. lati, superne nudi, stricti, folia $\frac{1}{2}$ superantes, teretes, læves, nitidi, nodis incrassatis. *Folia* plurima, basi vaginantia, stricta, curvata v. superne subrecurva, lineari-setacea, involuta, rigida, profunde striata, vix 1–$1\frac{1}{2}$ uncialia, sub lente setis minimis ascendentibus scaberula, læte viridia. *Vaginæ* latiusculæ, apertæ, laminæ æquilongæ, his latiores, basi submembranaceæ, sulcatæ, ad orem gradatim angustatæ; *ligula* scariosa, late ovata, obtusa, apice sæpius lacera. *Panicula* sub $\frac{2}{3}$ unc. longa, contracta, 2 lin. lata, pauci-sub 12-flora; rachi ramisque erectis, scabridis. *Spiculæ* majusculæ, brevissime pedicellatæ; pedicello valido, scaberulo. *Glumarum valvæ* inæquales, *superior* major, $1\frac{1}{2}$ lin. longa, utræque lanceolatæ, acutæ, marginibus superne ciliatis, carina scabrido-dentata. *Palea inferior* membranacea, glaberrima, late oblonga, superne abrupte truncata, irregulariter erosa v. subquadridentata, nervo medio interdum ad medium in aristam tenuem desinente, nunc ad apicem producto v. infra apicem evanido: *palea superior* minima, hyalina, enervis, apice truncata v. rotundata, flosculis nonnullis mihi non visa. *Squamulæ* late cultriformes. *Stamina* 3; *filamentis* brevibus; *antheris* late oblongis, stramineis. *Ovarium* late elliptico-ovatum; *stylis* breviusculis; *stigmatibus* plumosis. *Caryopsis* perianthio inclusus sed eo non adhærens, ovato-oblonga, teres, paleæ æquilonga.

A small tufted grass, nestling in the crevices of rocks in the most elevated places, highly characteristic of the rigorous climate it inhabits. In general appearance it resembles one or two of the Antarctic American species, but is quite distinct from them and from any other with which I am acquainted. The upper palea, if ever really present, is extremely small, what I have taken for it may have been a portion of the lacerated base of the lower; in parts of such extreme minuteness and of so membranous and hyaline a texture, it is very difficult to ascertain clearly the true position and form of this organ and of the squamulæ.

Plate LIII. *Fig.* 1, a spikelet; *fig.* 2, front, and *fig.* 3, back view of floret; *fig.* 4, squamula, stamens and ovarium; *fig.* 5, ripe caryopsis:—all *magnified.*

§. II. *Palea superiore basi setula aucta.*

4. Agrostis *Aucklandica,* Hook. fil.; panicula contracta, glumarum valvis subæquilongis dorso ciliatis flosculo breviter pedicellato duplo longioribus, palea inferiore subsericea basi barbata apice bifida quinquenervi, nervo medio in aristam validam geniculatam producto, palea superiore paulo breviore apice bifida bicarinata carinis ciliatis basi setula longe plumoso-ciliata aucta, foliis radicalibus erecto-patentibus strictis.

Hab. Lord Auckland's group; rocky places on the very tops of the hills, scarce.

Culmi cæspitosi, breviusculi, 3–4 unc. longi, validi, erecti, basi foliosi, simplices v. parce ramosi, superne folio unico foliisve duobus vaginati. *Folia* brevia, sub pollicaria, stricta, erecto-patentia, lineari-subulata, v. subsetacea, involuta, striata, glaberrima. *Vaginæ* laminam subæquantes et paulo latiores, foliorum superiorum elongatæ, profunde striatæ, utrinque attenuatæ, medio turgidæ, ore contracto; *ligula* ovata, scariosa. *Panicula* $\frac{3}{4}$ unc. longa, pauciflora; rachi ramisque scabridis. *Gluma* sub $1\frac{1}{2}$ lin. longa; *valvæ* lanceolatæ, acuminatæ, concavæ, uninerves, acute carinatæ, carina ciliata, flosculo incluso bis longiores, superior paulo brevior. *Flosculus* brevissime pedicellatus. *Palea inferior* ima basi sericeo-barbata, concava, apice bifida, inter segmenta subacuta aristata, subsericea, quinquenervis, marginibus dorsoque ciliatis; *arista* valida geniculato-curvata, scabrida, imo apice obtusa. *Palea superior* inferiore parum brevior v. æquilonga, lineari-oblonga, apice bifida, binervis, bicarinata, carinis argute ciliato-

OFFICE BOMBAY BRANCH OFFICE ASIATIC

Fitch. del et lith.

Bromus antarcticus. Hook fil.

prel: lith: Linn: imp.

ANTARCTIC EXPEDITION

denticulatis. *Setula* palea inferiore ¼ brevior, longissime plumoso-barbata; pilis strictis, sericeis, flosculo æquilongis. *Squamulæ* 2, oblique ovato-lanceolatæ, acuminatæ. *Stamina* 3; *filamentis* breviusculis; *antheris* subexsertis, linearioblongis, stramineis. *Ovarium* late ovatum; *stylis* basi approximatis; *stigmatibus* exsertis, plumosis.

Of this plant I have but very imperfect specimens, nor could I anywhere detect more of it than one or two culms which grew in the highest parts of the island, from whence the snow had but recently disappeared.

Tribe AVENACEÆ, *Kunth.*

3. TRISETUM, *Kunth.*

1. Trisetum *subspicatum, Beauv. Agrost.* p. 88. *Brown in Parry's First Voyage, App.* p. 292. *Richardson's App. to Franklin's 1st Voy.* p. 3, *and in Franklin's Journal,* p. 731. *Hooker, App. to Parry's 2nd Voy.* p. 409. *App. to 3rd Voy.* p. 129. *Flor. Bor. Am.* v. 2. p. 244. T. phleoides, *Kunth Gram.,* vol. i. p. 101. *Agrost.* p. 295, (*non Trinius*). Avena phleoides, *D'Urv. Fl. Ins. Mal. in Trans. Soc. Linn. Par.* vol. iv. p. 601. *Brongniart in Duperrey, Voy. Bot. Phan.* p. 29.

Hab. Campbell's Island; on ledges of rocks at the very summits of the mountains, abundant.

I have very closely compared numerous specimens of this plant with most copious suites of authentically named forms of the *T. subspicatum* from the northern hemisphere, without being able to detect any specific difference. In Europe and Northern America the plant varies much in size, in being of a slender or robust habit and in the form of its panicle; similar discrepancies are not observed in Campbell's Island, where its habitat is very limited; but in the Falkland Islands and in Tierra del Fuego it assumes various forms, whence it has been described by Admiral D'Urville as a different species, which was adopted by Brongniart with much doubt. The *T. molle,* Kunth and Trinius, (*Avena mollis,* Mich.), is decidedly only a variety of larger growth and may be added to the other synonyms already included by Kunth under this species. Few grasses have so wide a range as this, nor am I acquainted with any other Arctic species which is equally an inhabitant of the opposite polar regions. In Europe it is found at a very great elevation on the Alps and on the Pyrenees, as also in Lapland. In Asia it frequents the Altai range, the northern parts of Siberia and Kamtschatka, from whence it crosses to Kotzebue's Sound, and is apparently more generally distributed through Arctic America (than in the Old World), from the utmost limits of Polar vegetation in Melville Island, throughout Greenland and the Arctic Islands, the Arctic sea-coast, Labrador, Canada, and the Rocky Mountains. We have specimens in no way different from some of the European states, which were gathered on the Andes of Peru by Mr. McLean, and it is a particularly common grass on the sea-coast and upland regions of the Falkland Islands, forming a considerable portion of the pasturage. In Fuegia and South Chili it is probably no less abundant.

Tribe FESTUCACEÆ, *Kunth.*

4. BROMUS, *L.*

1. Bromus *antarcticus,* Hook., fil.; glaberrimus, panicula inclinata subcoarctata, ramis multifloris, spiculis ovato-oblongis 6–8-floris, flosculis pedicellatis basi sericeo-barbatis, arista valida palea longiore, foliis involutis culmum elatum superantibus. (Tab. LIV.)

Hab. Lord Auckland's group and Campbell's Island; a common grass upon the hills, forming large tussacks, particularly at an elevation of between 800 and 1200 feet.

Gramen elatum, 3–4 pedale, cæspites supra terram 2–3 ped. diametr. formans. *Culmi* ascendentes, validi, fasciculati; pars infima prostrata, subrepens, crassa, lignosa, 3–4 unc. longa, diametro digiti minoris, undique fibras crassas tortas intertextas emittens, reliquiis rigidis foliorum emortuorum obtecta, simplex v. divisa; culmi

deinde ascendentes, foliis plurimis per totam longitudinem vaginati, una cum foliis 1 unc. diametr., graciles, nodosi; internodiis sub 2-uncialibus; nodis constrictis, brunneis. *Folia* longissima, 3–4 pedalia, basi longe vaginantia, lineari-elongata, in apicem subfiliformem gradatim desinentia, paniculam longe superantia, per totam longitudinem involuta, glaberrima, coriacea, profunde striata, lævia, polita, viridi-straminea, supra pallide virescentia; marginibus lævissimis, prope ligulam parce pilosis. *Vaginæ* elongatæ, interdum pedales, ad basin fissæ, compressæ, inferiores paulo curvatæ, sulcatæ, coriaceæ, ad margines scariosæ, inferne induratæ, sublignosæ, pallide flavæ; *ligula* tenuissima, sericeo-barbata. *Panicula* subcoarctata, ovata v. ovato-oblonga, compressa, 4–6 unc. longa, multiflora, ramosa; rachi glaberrima, angulata; ramis gracillimis divisis, ad axillos pilosis v. barbatis. *Spiculæ* pedicellatæ; $\frac{3}{4}$–1 unc. longæ, ovato- v. lineari-oblongæ, $\frac{1}{3}$ unc. latæ, multi-8–11-flores, pallide flavæ, nitidæ. *Glumæ* coriaceæ, flosculis $\frac{2}{3}$ breviores, valvæ lanceolatæ, concavæ, ecarinatæ, glaberrimæ, obscure quinquenerves, nervis tribus interioribus interdum supra medium in unum coalitis; *valva superior* major, nervis magis distinctis, marginibus inferne sericeo-ciliatis. *Flosculi* pedicellati, basi remotiusculi; pedicellis dense villoso-barbatis. *Paleæ* 2, coriaceæ, subæquales, inferior concava, ad margines dorsoque basi sericea, superne bifida, inter segmenta lanceolato-subulata longe aristata, 5–7 nervis, nervis extus costatis; *arista* erecta v. patula, valida, palea bis longiore, scabriuscula, straminea. *Palea superior* lineari-oblonga, apice bidentata, longitudinaliter plicata, bicarinata; carinis dorso ciliatis, basi extus sericeis. *Squamulæ* 2, ovatæ, acuminatæ, integræ. *Stamina* 3, inclusa; *antheris* fulvis. *Ovarium* obovatum, compressum, sub-longe stipitatum; *stylis* basi remotis; *stigmatibus* parce plumosis.

This is a fine species and quite distinct from any other; it grows throughout the islands in great abundance, especially on the upland regions, where it forms much the greater proportion of the herbage, appearing in large, often isolated tussacks, one or two feet in diameter. Amongst them the Albatrosses are wont to raise their curious nests, which they construct of dirt and the straw of this grass, moulded into the form of a very large low Stilton cheese, with a shallow hollow at top: in these they lay a solitary egg weighing 16–20 oz. So strong is their attachment to their progeny that in no instance can an Albatross be removed from its charge without actual force; they vigorously defend their nests, striking boldly at the aggressor with their bills, so that it is sometimes difficult to obtain possession of the egg at all without cruelty to these beautiful and snow-white birds, whose confidence in man leads them to suspect no evil until actually attacked, and whose self-denying devotion to their young deserves a different treatment. The great size and beauty of the egg, coupled with its rarity in European collections, are attractions too strong to be resisted; and even had it not these reasons for being prized, it possesses in the excellence of its contents for culinary purposes a great recommendation to the members of a mess long restricted to salt provisions.

The tufts of *Bromus antarcticus* are of a very rigid, hard and wiry consistence, and after a few hours sunshine become so dry, that on being ignited a rapidly devouring flame quickly spreads from one hummock to another, until many acres are blazing in a most alarming manner. A fire incautiously kindled on one occasion by a small party of officers, soon covered many miles of ground; after consuming all the *Bromus* in its neighbourhood, it communicated with the brushwood which borders the woods, and thence to the low dense forest itself, for many hours threatening the destruction of the observatories and our little temporary village ashore; the progress of the fire was happily checked for a time by a small stream, until a severe storm of sleet, which the falling barometer and unusual (for these latitudes) fineness of the weather had predicted, finally put an end to the conflagration. From the ships in the harbour the sight was very grand, especially at night, the flames seeming to leap from spot to spot wherever this grass prevailed.

PLATE LIV. *Fig.* 1, a spikelet; *fig.* 2, a floret removed from the spikelet; *fig.* 3, squamulæ, stamina and ovarium, &c.; *fig.* 4, two forms of the squamulæ:—all *magnified.*

5. FESTUCA, *L.*

1. FESTUCA *scoparia,* Hook. fil.; panicula pauciflora subcoarctata, spiculis compressis majusculis 4–5-floris, glumarum valvis subæqualibus trinerviis flosculis brevioribus, palea inferiore scaberula basi longe

Fitch. del et lith.

Festuca foliosa. Hook: fil.

prel: lith: Linn: imp.

villoso-barbata apice subacuta, foliis arcte involutis plerumque longissime lineari-filiformibus rigidis gradatim attenuatis, culmis erectis fasciculatis superne gracilibus nudis.

Var. β, minor, foliis culmo subæquilongis.

Hab. Lord Auckland's group and Campbell's Island; abundant, especially in rocky places near the sea: β. Campbell's Island, on ledges of rock, alt. 1000 feet.

Gramen elatum, 2–3 pedale, suberectum, cæspites magnos densos præsertim inter rupes efficiens. *Radix* fibrosa, fibris intertextis, crassis, diametr. pennæ corvinæ, elongatis, 1–2 uncialibus, tortis, ramosis, suberosis v. spongiosis, pallide fuscis, fibrillosis v. interdum subtomentosis. *Culmi* plurimi, dense fasciculati, copiose foliosi, basi una cum vaginis foliorum ½ unc. diametri, ima basi divisi, e parte infima prostrata, ramosa, lignosa, ascendentes, graciles, 1–2 pedales, glaberrimi, vix striati, bis terve nodosi; internodiis 2–3 uncialibus; nodis constrictis, flavo-fuscis. *Folia* longissima, anguste lineari-filiformia, gradatim attenuata, subflexuosa, culmum bis terve superantia, basi longe vaginantia, per totam longitudinem arcte involuta, glaberrima, striata, subrigide coriacea, vaginis angustiora, in var. β, *folia* stricta, rigida, culmo breviora. *Vaginæ* lineares, elongatæ, 8–10 unc. longæ, ad basin latiorem fissæ, superne hiantes, pallide stramineæ, læves, nitidæ; ad orem utrinque in auriculas breves sursum productæ; *ligula* horizontali, angusta, inconspicua. *Panicula* 3–5 unc. longa, suberecta v. paulo inclinata, parce ramosa, pauciflora; rachi gracili, scabrida; ramis alternis, angulatis, scabridis, 3–5-floris. *Spiculæ* pedicellatæ, valde compressæ, ovato-oblongæ, sub 4 lin. longæ, 4-floræ. *Glumarum valvæ* coriaceæ, subæquales, flosculis breviores, lanceolatæ, acutæ, concavæ, dorso nervisque scabridis, inferiore paulo minore. *Flosculi* dissiti, inferior subsessilis, reliqui pedicellati, pedicello nisi ad basin flosculi nudo. *Palea inferior* lineari-oblonga, subacuta, dorso convexa, basi longe villoso-barbata, extus parce pilosa, quinquenervis, nervis prominentibus, extus scabridis. *Palea* superior ¼ brevior, apice bifida, bicarinata, carinis scabrido-ciliatis. *Squamulæ* obovato-oblongæ, ad medium bipartitæ; segmentis inæqualibus, ovato-subulatis, acuminatis. *Stamina* 3; *filamentis* breviusculis; *antheris* paulo exsertis, stramineis. *Ovarium* minutum, late obovatum; *stylis* basi discretis. *Caryopsis* glabra, palea ½ brevior, obovata, apice gibbosa, latere unico excavata, stylis lateralibus.

This plant is most nearly allied to *Festuca? littoralis*, Br. (Prodr., p. 178), from which it differs, according to our specimens from various parts of New Holland, Tasmania, and New Zealand, in the longer leaves, fewer flowered panicle, narrower florets, in the entire absence of any toothing at the apex of the lower palea, and in the long villous beard at its base. That plant also has turgid distichous approximated florets, resembling those of a *Uniola*. I have referred this species to *Festuca*, as Mr. Brown has the *F. littoralis*, though with a mark of doubt; they are manifestly congeneric, but in this I see no approach to the character of *Danthonia*; they further bear a good deal of resemblance to the *F. spadicea*, L., a South of Europe plant.

Of M. Labillardière's *F. littoralis* we have an authentically named specimen, gathered by that voyager himself, and received from our liberal correspondent Mr. Webb of Paris; it entirely resembles the figure given in 'Plantæ Nov. Holl.' (t. 27), especially in the branching and elongated lower portion of the culm, but the pedicels of the florets are decidedly hairy and the lower palea truncated, characters not portrayed in the plate alluded to, but which Mr. Brown has observed in his plant. This species Nees v. Esenbeck notices in his 'Gramina Novæ Hollandiæ,' (vid. Lond. Journ. of Bot., vol. ii. p. 419), as "Schedonorus *Billardierianus*, N. ab E., Poa *littoralis*, Lab. nec R. Br.," and further quotes Mr. Gunn's specimens, which agree with Labillardière's own and with Mr. Brown's description. Kunth (Agrost., p. 409), unites these two plants, retaining them under a section of *Festucæ*, which includes his "species anomalæ, minus cognitæ et dubiæ." Sprengel refers it to *Triodia*, and Trinius in his beautiful work places it in *Arundo*! (*A. triodioides*, Trin. Species Gramin. vol. iii.)

2. Festuca *foliosa*, Hook. fil.; panicula inclinata majuscula coarctata ramosa multiflora, ramis erectis compositis, spiculis sub 4-floris late ovatis, glumarum valvis lanceolatis v. acuminatis æqualibus, flosculis

breviter pedicellatis brevioribus, palea inferiore subsericea acuta quinquenervi basi barbata dorso scabrida, superiore breviore bifida, squamulis basi connatis, foliis subdistiche insertis longissimis latis planis carinatis glaberrimis, culmis cæspitosis compressis. (TAB. LV.)

Var. β, minor, spiculis minoribus subtrifloris.

HAB. Lord Auckland's group and Campbell's Island; on banks and in rocky places, chiefly near the sea, very abundant. β. more common in Campbell's Island; growing amongst rocks. McQuarrie's Island, (*Herb. Hook.*)

Rhizomata prostrata, crassa, lignosa, 3–4 unc. longa, crassitie digiti minoris et infra, creberrime nodosa, radices plurimas fibrosas ubique emittentia, reliquiis fibrosis foliorum vetustorum obtecta, cæspites densos magnos scabellum simulantes efficientia, versus apices culmos plurimos emittentia; fibris 3–4 unc. longis, filiformibus, subrigidis, hic illic tortis, simplicibus v. fibrillosis. *Culmi* validi, erecti, 2–3 ped. longi, $\frac{1}{2}$–$\frac{3}{4}$ unc. lati, basi compressi et foliis abbreviatis vaginati; in var. β, 6 unc. ad pedalem et graciliores. *Folia* plurima, plantis junioribus præsertim distiche inserta, longissime linearia, flexuosa, culmum longe superantia, 3–4 ped. longa, gradatim attenuata, latiuscula, $\frac{1}{2}$–$\frac{3}{4}$ unc. latitudine, plana, per totam longitudinem carinata, glaberrima, striata, utrinque opaca, herbacea, læte viridia, subtus glaucescentia. *Vaginæ* latæ, 3–4 unc. longæ, compressæ, striatæ, opacæ, ad basin fissæ, foliorum vetustorum 1 unc. latæ, emarcidæ fibrosæ; ore paulo contracto, sæpe fusco-brunneo; *ligula* conica, longitudine varia, scariosa, acuta v. obtusa, integra v. lacera. *Panicula* lineari-oblonga, contracta, valde compressa, decomposita, nutans v. inclinata, 5–8 unc. longa, 1–3 lata, rachi valida, tereti, glaberrima; ramis suberectis, compositis, $1\frac{1}{2}$–2 unc. longis, glaberrimis, politis, multifloris. *Spiculæ* pedicellatæ, $2\frac{1}{2}$–3 lin. longæ, pedicello gracili, curvato. *Glumarum valvæ* æquales, lanceolatæ, acuminatæ, flosculis breviores, concavæ, sub-carinatæ, basi trinerves; nervis tenuibus, intermedio dorso vix scaberulo, lateralibus medium vix attingentibus. *Flosculi* 3–5, plerumque 4, inferior sessilis, reliqui breviter pedicellati, pedicello glabro. *Palea inferior* subherbacea, acuminata, apice subincurva, dorso ciliata, basi breviter villoso-barbata, subsericea, quinquenervis. *Palea superior* paulo brevior, oblonga, bifida, bicarinata, carinis ciliatis. *Squamulæ* basi carnosæ et connatæ, subquadratæ, oblique bifidæ; segmentis acutis, erosis; in var β, obovatæ, bipartitæ, segmentis acuminatis. *Stamina* 3; *filamentis* elongatis; *antheris* exsertis, stramineis. *Ovarium* minimum, ovatum; *stylis* basi approximatis, elongatis; *stigmatibus* parce plumosis.

A grass of large growth and very leafy, affording a rich and nutritious food for animals; in some cases it forms large mounds or tussacks, not unlike those of the *Dactylis cæspitosa* of the Falkland Islands (the Tussack grass), but smaller; with, however, a similarly luxuriant habit. In size it varies extremely, from several feet to a few inches in height, and from a robust to rather a slender habit; it is only indeed when growing in large masses that it assumes a characteristic appearance, in this respect further resembling the celebrated grass above mentioned. The small specimen from McQuarrie's Island especially, I should have been inclined to regard as another species, had the plant not appeared in a similarly starved state in Campbell's Island. In the large culms the ample sheaths of the old leaves conceal the compressed form and distichous insertion of the leaves, which are very marked in the younger ones, and in certain states as conspicuous as in small states of the Tussack grass itself.

It is with much hesitation that I refer this to *Festuca*, for I know no species of that genus with a similarly leafy and soft habit, or with compressed culms and distichous leaves, the only one indeed which appears to bear any resemblance to it is the *F. Donax*, Lowe, a Madeira plant, and that merely in being of a large size and having a somewhat similar large and branched panicle. The want of the arista alone at the apex of the lower palea restrains me from placing it with what is certainly its nearest ally, the true Tussack Grass.

PLATE LV. *Fig.* 1, spikelet; *fig.* 2, a floret; *fig.* 3, connate squamulæ; *fig.* 4, one squamula of var. β; *fig.* 5, ovarium, style and stigmata:—all *magnified.*

6. POA, *L.*

1. Poa *annua*, Linn., *Sp. pl.* 99. *et auctorum.*

Hab. Lord Auckland's group; abundant on the tomb of a French sailor, growing with *Stellaria media*, With.; both undoubtedly introduced.

This is the common European form of the plant; it has not as yet spread far from the above locality.

2. Poa *ramosissima*, Hook. fil.; glaberrima, panicula contracta ovato-lanceolata, ramis strictis suberectis alternis bis terve divisis, spiculis ovatis 3–4-floris, glumis acutis, flosculis basi remotis, palea inferiore acuta quinquenervi, foliis planis paniculam superantibus vaginisque lævibus, ligula late ovata apice truncata lacera, culmis laxe cæspitosis basi longe nudis et prostratis superne fasciculatim ramosissimis, ramis brevibus omnibus floriferis.

Var. β, palea exteriore basi extus longe villoso-barbata.

Hab. Lord Auckland's group; very common on the rocks overhanging the sea, trailing over banks, &c. β. Campbell's Island; plentiful on the faces of hills sloping to the south; rare in Lord Auckland's group.

Gramen gregarium, late supra terram diffusum, pascuum copiosum efficiens, pedale et ultra. *Culmi* elongati, longe prostrati, pars prostrata nuda, simplex, pedalis, crassitie pennæ corvinæ, rigida, fusca, vaginis emarcidis et fibrosis foliorum vetustorum vestita, nodosa; internodiis teretibus, glaberrimis; nodis incrassatis. *Rami* plurimi, ab apice partis prostrati erecti v. ascendentes, fasciculati, pluries divisi, 3–4 unc. longi, foliosi, omnes floriferi, graciles, basi pare nodosi, foliis emarcidis subcriniti. *Folia* erecta, paniculam superantia, 3–4 unc. longa, anguste lineari-subulata, vix $\frac{3}{4}$ lin. lata, planiuscula, glaberrima, obsolete striata, utrinque opaca. *Vaginæ* laminam longitud. subæquantes, teretes, læves, striatæ, ad basin fissæ, marginibus subscariosis, collo interdum castaneo; *ligula* scariosa, late ovata, superne abrupte truncata, lacera. *Panicula* erecta, lineari-oblonga v. ovato-lanceolata, 1–1$\frac{1}{2}$ unc. longa, $\frac{1}{3}$ unc. lata, compressa, ramosa; rachi gracili, angulata, lævi; ramis alternis, erectis, $\frac{1}{4}$ unc. longis, spiculas pedicellatas 3–4 gerentibus. *Spiculæ* herbaceæ, ovato-lanceolatæ, 2 lin. longæ, 3–5-floræ. *Glumarum valvæ* subæquales, concavæ, acutæ, glaberrimæ, flosculis breviores; *superior* latior, trinervis; *inferior* acuminata, uninervis. *Flosculi* dissiti, longius pedicellati, infimo sessili; pedicello glaberrimo v. infra palcam barbato. *Palea inferior* late ovata, acuta, quinquenervis, nervis lateralibus obscuris, glaberrima, var. β excepta ubi palea basi villoso-barbata evadit. *Palea superior* lineari-oblonga, inferiore brevior, apice bifida, bicarinata, carinis glabris. *Stamina* 3; *filamentis* brevibus; *antheris* stramineis, inclusis.

This is a very abundant grass in both groups of islands and of a most singular habit of growth. The culms are invariably prostrate and quite simple for a foot or so, when they suddenly ascend and divide into many short, leafy branches, each bearing a panicle of flowers. It forms a copious, soft, green herbage, especially on the banks near the sea, always throwing its long culms over the edges of the cliffs, which are thus fringed with a delicate festoon of green.

The almost constant presence of a villous tuft at the base of the lower palea, in the Campbell's Island specimens, is a singular circumstance; but as I have detected no further distinction between these two varieties, and in some specimens observed intermediate grades, it cannot be considered as a character of specific importance.

3. Poa *breviglumis*, Hook. fil.; glaberrima, panicula laxa erecta pauciflora, rachi gracili, ramis suberectis oppositis v. subverticillatis divisis versus apices floriferis, spiculis obovato-oblongis 4-floris, glumarum valvis inæqualibus inferiore minima, superiore flosculis $\frac{1}{2}$ breviore apice bifida v. emarginata, flosculis pedi-

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cellatis basi nudis, palea inferiore glaberrima ovato-lanceolata obtusa concava trinervi nervis sub lente scabridis, foliis planis lineari-setaceis culmo brevioribus, culmis basi ramosis inclinatis v. ascendentibus.

HAB. Campbell's Island; open grassy places near the sea, not uncommon.

Rhizomata tenuia, breviuscula, ramosa, radices fibrosas plurimas emittentia; fibris tortis, filiformibus, fibrillosis, fuscis. *Culmi* basi pluries divisi et inclinati, deinde ascendentes, graciles, 6 unc. ad pedalem, crassitie pennæ passerinæ, nodosi, ad nodos plerumque geniculati; internodiis uncialibus, glaberrimis, striatis, lævibus, nitidis; nodis subincrassatis, fuscis. *Folia* pauca, $1\frac{1}{2}$–3 unc. longa, culmo breviora, suberecta v. patentia, anguste linearisubulata, sub 1–$1\frac{1}{2}$ lin. lata, gradatim attenuata, planiuscula, striata, glaberrima, utrinque opaca, læte viridia. *Vaginæ* lamina breviores, profunde striatæ, marginibus scariosis, ore paulo contracto; ligula late ovata, apice rotundata, scariosa. *Panicula* erecta, laxa, gracilis, 3–5 unc. longa, parce ramosa, pauciflora, rachi tereti, gracili, stricta, striata, lævi, nitida; ramis remotis, plerumque verticillatis v. oppositis, gracillimis, divisis, suberectis patentibusve, inferioribus elongatis, $1\frac{1}{2}$ uncialibus, versus apices floriferis. *Spiculæ* sub $1\frac{1}{2}$ lin. longæ, obovato-oblongæ, compressæ, 4-floræ, pedicellatæ; pedicello spiculæ subæquilongo, striato, scaberulo. *Glumarum valvæ* parvæ, glaberrimæ, valde inæquales, *inferior* minuta, ovata, obtusa, concava, uninervis; *superior* duplo triplove major, flosculi dimidii longitudine, ovato-oblonga, apice truncata, emarginata v. bidentata, concava, trinervis, nervo medio scaberulo. *Flosculi* basi dissiti, glaberrimi, infimus sessilis, reliqui pedicellati, terminalis cum arista brevi alterius incompleti sæpe auctus; pedicellis glaberrimis. *Palea* inferior oblongo-lanceolata, obtusa, concava, trinervis, nervis prominentibus sub lente scaberulis. *Palea* superior paulo brevior, lineari-oblonga, apice bifida, bicarinata, carinis minute ciliatis. *Squamulæ* late obovato-quadratæ, oblique bifidæ, segmentis acutis, valde inæqualibus. *Stamina* 3; *filamentis* elongatis; *antheris* exsertis, brevibus, late oblongis. *Ovarium* obovato-oblongum; *stylis* basi discretis, lateraliter insertis; *stigmatibus* longe plumosis, exsertis.

In several respects this species approaches the following genus *Catabrosa*, especially in the small glumes, the upper one of which is erose or toothed at the apex, and in the remote bases of the styles, but the palcæ are not truncated, though obtuse, and the florets are always four in number.

In the very short glumes and indeed in the entire structure of the spikelets, florets and their squamulæ and ovarium, it resembles the *Sphenopus divaricatus*, Reich., with which it further agrees in the branching of the panicle, its few flowers being placed towards the apices of the branchlets; but it has not the general habit of that curious little grass, nor the peculiarly thickened pedicels to the spikelets. M. Kunth (Agrost., p. 392), has reduced the genus *Sphenopus* (Trinius) to *Festuca*; but Theodore Nees, in his beautiful genera of German plants, has retained that generic name and published an excellent analysis of it; I quite agree with him in considering it as more closely allied to *Poa*, in which genus its original describer, Gouan, placed it, than to *Festuca*.

7. CATABROSA, *Palis.*

1. CATABROSA *antarctica*, Hook. fil.; panicula laxa pauciflora, glumarum valvis inæqualibus inferiore lineari-oblonga subacuta superiore oblongo-lanceolata apice breviter bifida v. bidentata, palea inferiore apice truncata basi pilosa 3–5 nervi nervis obscuris inter medio in aristam brevissimam setiformem producta, antheris brevibus late oblongis, foliis anguste linearibus involutis paniculam superantibus, culmis gracilibus erectis basi divisis. (TAB. LVI.)

HAB. Campbell's Island; on moist rocky ledges, rare, only found at an elevation of 1000 feet.

Gramen gracile, 6–8 unciale, magnitudine sat varians. *Rhizomata* laxe cæspitosa, elongata, 1–2 unc. longa, curvata, crassa, diametro pennæ corvinæ vel minora, lignosa, fusca, nodosa, ad nodos fibrosa, versus apices divisa v. subramosa; fibris elongatis, tortis, fuscis, fibrillosis. *Culmi* fasciculati, erecti, graciles, foliosi, 2–5 unc. longi, remote nodosi; internodiis teretibus, striatis, sub $\frac{1}{2}$ uncialibus, glaberrimis; nodis constrictis, brunneis. *Folia* erecta,

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Catabrosa antarctica. Hook.fil.

elongata, culmum superantia, superne flexuosa, basi longe vaginantia, longe et anguste linearia, involuta, glaberrima, striata, lævia, læte viridia. *Vaginæ* folii $\frac{1}{4}$ longitudine, angustæ, ad margines subscariosæ, profunde striatæ; ligula elongata, lineari, acuminata, membranacea, ad apicem fimbriata. *Panicula* 3–5 unc. longa, erecta, gracillima, parce ramosa, pauciflora; rachi gracili, tereti, lævi, flexuosa; ramis alternis vel plerumque subverticillatis, filiformibus, divisis, suberectis v. modice patentibus, præsertim apicem versus floriferis. *Spiculæ* parvæ, $1\frac{1}{2}$ lin. longæ, remotæ, micantes, glaberrimæ, 2-rarius 3-flores, flore terminali tabescente, pedicellata; pedicello sub lente glaberrimo. *Glumæ* bivalves; valvæ inæquales, flosculis inferioribus breviores, herbaceo-coriaceæ, *inferior* oblongo-lanceolata, acuta, marginibus minute ciliatis, uninervis, nervo dorso scaberulo; *superior* $\frac{1}{2}$ longior, oblongo-lanceolata, apice bifida truncata v. emarginata, concava, dorso carinata, trinervis, nervis prominentibus, lateralibus ad medium evanescentibus, carina dorso ciliata, marginibus superne tenuiter ciliatis. *Flosculi* remoti, superior pedicellatus; pedicello infra florem incrassato, et pubescente. *Palea inferior* late ovato-oblonga, concava, abrupte truncata, superne plus minusve distincte 4–5-dentata, dente medio interdum in aristam brevissimam producto, membranacea, obsolete 3–5 nervis, basi pilosa: *palea superior* subæquilonga, apice bifida, bicarinata, carinis ciliatis. *Squamulæ* ovatæ, acuminatæ, subcarnosæ, integræ. *Stamina* 3, filamentis gracilibus; *antheris* late oblongis, prope basin fixis, loculis apicem versus divaricatis, flavo-stramineis. *Ovarium* late obovatum, basi subattenuatum; *stylis* basi distinctis, latere unico insertis; *stigmatibus* valde plumosis. *Caryopsis* ovato-oblonga, paleis $\frac{1}{2}$ brevior.

My specimens of this grass, though not in so good a state as is desirable, are, I think, sufficient to prove it a most distinct species of an European genus, which reaches in Great Britain the parallel of 59°, the 67th degree in Lapland and Iceland, and the 57th in North America.

The present species differs considerably from the type of the genus, in its slender habit and narrow leaves, and more particularly in the larger glumes being less truncated and narrower, in the more unequal paleæ and obscure nerves of the lower one, and in the very short anthers.

PLATE LVI. *Fig.* 1, a spikelet; *fig.* 2, glumes; *fig.* 3, a floret; *fig.* 4, a squamula; *fig.* 5, a stamen; *fig.* 6, ovarium, styles and stigmata; *fig.* 7, caryopsis:—all *magnified.*

XXXII. FILICES, *Willd.*

1. HYMENOPHYLLUM, *Sm.*

1. HYMENOPHYLLUM *minimum*, A. Rich.; pusillum, cæspitosum, glaberrimum, frondibus late-ovatis falcato-recurvis pinnatifidis v. basi pinnatis, segmentis integris bifidis rariusve bipartitis linearibus obtusis marginibus ciliato-dentatis per totam longitudinem concavis subrigidis siccitate rufo-fuscis, involucris terminalibus omnino exsertis subpedicellatis obovato-cuneatis valvis dorso spinuloso-ciliatis, ore breviter bilobo argute dentato, rachi stipiteque crassiusculis rigidis. H. minimum, *A. Richard, Flor. Nov. Zel.* p. 93. t. 14. f. 2. *F. Cunn. Prodr. Flor. Nov. Zel. in Hook. Comp. Bot. Mag.* vol. ii. p. 369. *Presl, Hymenophyll.* p. 32.

HAB. Lord Auckland's group; on trunks of trees in the woods; rare.

Caudex repens, radicans, rigidus, filiformis, seta equina crassior, ater. *Frondes* plerumque plus minusve falcato-recurvæ v. demissæ, rarius suberectæ, $\frac{1}{4}$–$\frac{1}{2}$ unc. longæ, rigidæ, firmæ, pinnatifidæ v. segmentis inferioribus dissitis, basi pinnatæ; pinnis seu segmentis superioribus integris, inferioribus bifidis v. bipartitis, infimis interdum pinnatifidis, omnibus linearibus, obtusis, argute ciliato-dentatis, per totam longitudinem concavis, fusco-brunneis, siccitate rufis; costa rachique validis, glaberrimis. *Involucrum* ad apicem frondis terminale, solitarium, majusculum, breviter pedicellatum, ovato-cuneatum, basi attenuatum, durum, siccitate atrum; valvis dorso spinulis mollibus basi latiusculis obsitis; ore breviter bilabiato, latiusculo, labiis rotundatis, argute spinuloso-dentatis, dentibus erectis, sinubus rotundatis; receptaculo valido, rarius elongato, exserto.

During the examination of the materials from which the genus *Hymenophyllum* was described in the second part of the "Species Filicum," I had but cursorily investigated the Auckland Island species, and considered the *H. minimum* of Richard to be a small variety of *H. Tunbridgense*, with terminal involucres. This state is not uncommon in the vicinity of the Bay of Islands, and this I laid before my father; whence the *H. minimum* was by him included as a synonym of that widely diffused species. Amongst my specimens of *H. multifidum* I now find others of this very minute and most distinct plant, which have enabled me to correct that error. In the rigid consistence of the frond, its decurved habit and lurid colour, it is more nearly allied to *H. multifidum* than to any other species, but the curiously spinulose valves of the involucre afford an excellent specific character, as do the small size, simple frond and singularly concave segments, which appear like the half of a tube, that is, hollow throughout their length and open at the end. Between this plant and the *Trichomanes cæspitosum* of the Falkland Islands and Cape Horn, much analogy exists, especially in size, locality and habit; in each the fronds are generally once divided, with the segments concave and obtuse; both have the indusia free or nearly so, spinulose at the back of the valves, and though often lateral in the latter plant, the fructifications are, especially on small specimens, very generally terminal, and may prove to be truly lateral in *H. minimum*, should that plant be found in a more luxuriant state than M. Richard's or my specimens exhibit. In the 'Flora Novæ Zelandiæ' M. Richard does not mention the original discoverer of the species; the figure in the 'Voy. de la Coquille' is not characteristic of the curious involucres.

2. Hymenophyllum *multifidum*, *Sw. Syn. Fil.* p. 149 and 378. *Hook. and Grev. Ic. Fil.* t. 165. *Presl, Hymenophyll.* p. 32. *Hook. Sp. Fil.* vol. i. p. 98.

Hab. Lord Auckland's group and Campbell's Island; in all situations, from the level of the sea to the tops of the mountains, growing on the ground, on trunks of trees and on rocks.

A very common New Zealand fern, from the latitude of the Bay of Islands to that of Campbell's Island; representing in this region the *H. tortuosum* of Antarctic America and the *H. Tunbridgense* of the Northern Hemisphere. It is very variable in size, but the fronds are always remarkably bent downwards, their apices often touching the ground.

3. Hymenophyllum *demissum*, *Sw. Syn. Fil.* p. 147 and 374. *Schkuhr Fil.* t. 135. c. *F. Rich. Fl. Nov. Zel.* p. 92. *Hook. Sp. Fil.* vol. i. p. 109. Sphærocionium demissum, *Presl, Hymenophyll.* p. 35.

Hab. Lord Auckland's group; in dense woods near the sea, often covering the ground with large patches of a lurid green colour.

The specimens of this beautiful species are smaller than those collected in the northern island of New Zealand, but do not otherwise differ.

Mr. Presl's genus *Sphærocionium* is apparently founded only upon the form of the receptacle, in its being "shorter than the indusium, naked and cylindrical below, and thickened and globose at the apex, which alone bears the capsules;" such characters can hardly be applied to this species, where the receptacle, though short, produces capsules for at least two-thirds of its length, the lowest portion or third part only being naked and cylindrical, gradually thickening upwards into an elongated club-shaped body.

The structure of the receptacle in most species of the genus *Hymenophyllum*, in its more extended sense, appears to me very uniform; in length it varies extremely, but there is generally a short cylindrical body, which may be considered a pedicellus to the elongated capsuliferous portion or true receptaculum; upon the comparative length of this latter portion the genus of Presl rests. In some New Zealand specimens of this fern the pedicel is so short as to be almost obliterated, the receptacle appearing like a stout column covered throughout its length with capsules; in others the whole organ is reduced to an elevated tubercle in the bottom of the involucre. Of the other plants included by Mr. Presl under this genus I have examined several; of these, *S. infortunatum*, the only

St. Helena species of this genus, and originally noticed in Pritchard's list of the plants of that island as *Hym. capillare*, has the receptacle more nearly as described, though I should rather have called it clavate than "apice globoso-incrassatum"; the capsules are not confined to its apex, but extend half way down the receptacle. *S. ricciæfolium* I have not seen in fruit; it appears, however, identical with *H. polyanthos*, Sw. (v. Sp. Fil. p. 107.). Whether the *H. polyanthos*, Hook. and Grev., be that of Swartz, or, as Presl supposed, another species, is difficult to decide, without authentic specimens of Swartz's plant; it is, however, an excessively common West Indian form, nor does its receptacle differ in any particular from that of several species of *Sphærocionium*; as from *S. sanguinolentum*, Presl, (certainly a variety of *polyanthos*, Hook. and Grev., if not of Swartz), from some states of *demissum* and others. *S. caudiculatum*: in most of the specimens in Hook. Herb. the short pedicellus is surmounted by a very large depressed sphere covered with capsules, in some indusia this character is very striking, but in others, from the same specimen, it becomes considerably smaller, and in what is manifestly the same plant from other localities the receptacle is simply clavate but very broad. *S. dilatatum*: this very common New Zealand plant is properly retained in the immediate vicinity of *demissum*; in no case, however, do I find its receptacle to be globose and incrassated at the apex, it is very like, and varies similarly with, that of the last-named plant. *S. crispatum*: the receptacle of Indian specimens quite agrees with Presl's character, in some Van Diemen's Land ones that organ is narrower at the summit. *S. badium, gracile, axillare,* and *abietinum* have the receptacles very short and clavate, or more or less capitate. It is not to be wondered at that an organ so variable in the above-mentioned species should afford too frail characters upon which to found a genus; and a similar examination of some of the plants included in Presl's *Hymenophyllum* will show that it exists of all lengths, between the long exserted stout column so often seen in *H. multifidum* and *secundum* and the short sessile receptacle of *demissum* and *dilatatum*; transition stages, connecting the two genera, are found in both. The limits of *Hymenophyllum*, as established in the 'Species Filicum,' have been defined after a study of several thousand specimens; a re-examination of many of which has convinced me that neither can most of the new genera formed out of it remain, nor such sections as that author has proposed under the names of *Evoluta* and *Dimidiata*.

Having occasion to describe several species of this genus during the course of publishing the results of the Antarctic Expedition, some apology seems necessary for not adopting Presl's views of the Order *Hymenophyllaceæ*. I am fully sensible of the great value of that author's labours and of the accuracy and precision with which he has described what he has examined, as also of his intimate acquaintance with the whole order of Ferns: and whilst I cannot but place some reliance upon the results of my own observation of far more extensive suites of specimens, in many cases gathered by myself, than Presl has probably had access to, I would further remark, that whilst examining, in the Hookerian herbarium, almost all the species mentioned by Presl, and authentically named specimens of many, I have constantly met with abundant evidence of that writer's accuracy in his descriptions of individual species, together with full proof that he has considered some of their peculiarities as of too much importance in Systematic Botany.

4. Hymenophyllum *flabellatum*, Lab.; *Fl. Nov. Holl.* v. 2. p. 101. t. 250. f. 1. *Hook. Sp. Fil.* v. 1. p. 111. *Presl, Hymenoph.* p. 32. H. nitens, *Brown Prodr.* p. 159. *Hook. et Grev. Ic. Fil.* t. 197.

Hab. Lord Auckland's group; not uncommon on the old and decaying trunks of trees and upon rocks both near the sea and on the hills.

Of a paler but brighter and more glistening green than the former. A very abundant New Zealand and Tasmanian species, varying a good deal in size and somewhat in the form of the frond.

5. Hymenophyllum *rarum*, Br.; *Prodr.* p. 159. *Hook. Sp. Fil.* v. 1. p. 101. H. semibivalve, *Hook. et Grev. Ic. Fil.* t. 83. *Presl, Hymenoph.* p. 32.

Var. β. *Hook. Sp. Fil.* p. 101.

Hab. Lord Auckland's group; in woods near the sea, rare.

A very variable species, which also inhabits the extreme south of the American continent, as well as other and warmer parts of the globe. Presl, retaining the name of *H. semibivalve*, arranges this in his section "*Cycloglossum*," removing it from that of "*Euhymenophyllum*," in which the *H. asplenioides, fumarioides* and *nitens*, Br., are placed; but in the structure of the involucre and receptacle I have been unable to detect even a specific difference between those species and the *H. rarum* or *semibivalve*. The *H. fumarioides*, on the authority of Drège's specimens, which are so named and agree in the main with Bory's description, has been included in the "Species Filicum" under *H. rarum*, of which plant I have examined numerous and very varying Cape forms from Messrs. Harvey, Forbes, Mund and Capt. Carmichael, and have also gathered it upon Table Mountain. In both Tasmanian and New Zealand specimens I have seen the receptacle to be either included or exserted, and in one from the former country the form of the indusia varies from being short, almost wholly sunk in the frond, much broader than long, with scarcely prominent lips, to an elliptical ovate form, with the lips protruded and nearly twice the length of the sunk portion. The *H. asplenioides* and *abruptum* are both very nearly allied to *H. rarum*, the latter especially; the former has a much stouter caudex and stipes.

2. ASPIDIUM, *Sw.*

1. Aspidium (Polystichum) *venustum*, Hombr. et Jacq.; frondibus elongatis lineari-oblongis acuminatis bipinnatis, pinnis linearibus acuminatis, pinnulis breviter petiolatis oblique ovatis acutis basi superne productis grosse crenato-dentatis coriaceis concavis glaberrimis venosis, segmentis inferioribus obtusis superioribus acutis acuminatisve, rachi stipiteque superne villoso-hirtis, subtus paleis majusculis dense vestitis. A. venustum, *Hombr. et Jacq. in Voy. au Pole Sud, Bot. Monocot. Cryptog.* t. 5. *sine descript.* A. Waikarense, *Colenso, MSS. in Herb. Hook.*

Hab. Lord Auckland's group and Campbell's Island; very abundant from the level of the sea to an altitude of 1200–1400 feet.

Filix, in sylvis maritimis caulescens. *Caudex* 2–4 pedalis, erectus, stipitibus frondium vetustorum fibrisque nigro-fuscis ubique vestitus, $\frac{1}{2}$ ped. diametr. et infra, versus apicem frondibus undique patentibus coronatus. *Frondes* 3–5 pedales, exemplaribus sylvicolis horizontaliter patentes, alpicolis suberectæ, $\frac{1}{2}$–$\frac{3}{4}$ ped. latæ, lineari-oblongæ, gradatim acuminatæ; pinnis plurimis, 4–6 uncialibus, $\frac{3}{4}$ unc. latis, linearibus, acuminatis, coriaceis, glaberrimis, pinnatis, pinnis ultimis in caudam profunde et argute serratam confluentibus, pinnulis distantibus v. subimbricatis, divaricatis, breviter sed manifeste petiolatis, infimis supra rachin plus minusve productis, omnibus oblique ovatis, acutis, convexis, rigide coriaceis, grosse crenato-serratis, basi cuneata superne oblique producta, margine inferiore costæ parallelo, segmento infimo majore, obtuso, intermediis obtusis acutisve, supremo acuto, pungente, rarissime omnibus obtusis acutisve, superne lineis depressis notatis, venis furcatis pluriesve divisis, subtus prominentibus, glaberrimis, rarius exemplaribus valde coriaceis evanidis. *Sori* parvi v. minimi, plerumque 4–7 quavis pinnula, costæ propius quam margini; receptaculum elevatum; indusium minimum, stipitatum, peltatim affixum, orbiculare. *Costa rachisque* rigidæ, validæ, superne tomento molli rufo subvillosæ, subtus hic illic tuberculatæ, hirtæ, squamis paleisque undique et tota obsitæ; *paleæ* plurimæ, majusculæ, scariosæ, subsquarrosæ, curvatæ, ovato-oblongæ, in acumen elongatum attenuatæ, rufo-brunneæ, nitidæ, margine pallide fulvo.

The above description has been drawn up after the examination of many states of a plant, which will very likely give as much trouble to a botanist in the antipodes as the states of its representatives, *A. aculeatum* and *angulare*, have caused to those of Europe. It was first discovered by Sir Joseph Banks and Dr. Solander in New Zealand, to small specimens gathered by whom the MS. name of *Asp. coriaceum*, β. is attached in the Banksian Herbarium. I consider myself fortunate in having met with it in Lord Auckland's group, where it varies considerably, inhabiting various situations from the level of the sea to an altitude of 1200 to 1400 feet; in the former locality appearing as a most elegant subarborescent species, for the stipites do really become consolidated into a ligneous caudex, and in the

upper regions forming small tufts of the ordinary mode of growth in ferns. Besides these variations in size and luxuriance, depending wholly upon climate, I find that the pinnæ and pinnules are more or less remote, with longer or shorter apices, and the segments of the latter are either decidedly rounded and blunt, or all acuminated and pungent; in general, however, the lower segments are obtuse and the upper acute. As a species it is abundantly distinct from *A. proliferum*, Br., in the presence of the large paleæ. In New Zealand it is probably even a more sportive plant than in the islands now under consideration, for I am inclined to refer to it Mr. Colenso's *A. Waikarense*, *A. sylvaticum*, and *A. pulcherrimum*.

The islands of New Zealand have long been known to produce a very large proportion of Ferns compared to their phænogamic plants; a circumstance which must strike the most casual observer. Being an attractive branch of Botany, it might be supposed that the excess of this Natural Order was rather apparent than real, and only due to its species being more generally collected and transmitted to England: but this is not wholly the case, the exertions of recent collectors having increased this proportion, to what is probably the maximum; for being more widely distributed than the higher orders, the hitherto partially explored middle island may be expected to produce new forms of flowering plants, accompanied with a large number of Ferns it is true, but those of species already detected elsewhere. The species of widely spread natural orders, being very frequently themselves distributed over large areas, it follows that the relative amount which such bear to the remainder of the vegetable kingdom, in a country so large as New Zealand, cannot be ascertained from an examination of the productions of one half of its area only. Mr. Brown has stated (Expedition to Congo, App. p. 462) the conditions which appear most requisite for the abundant production of Ferns, and these are to a great extent amply fulfilled in the position and climate of New Zealand; for not only the number of species is great, but the mode of growth of many is indicative of a lower latitude than they inhabit, no less than six assuming the arborescent form, one of which attains the 47th degree of south latitude: besides this, other species, whose stipites spring from the root at once, become caulescent, having their fronds disposed on the apex of the caudex, as those of the true tree-ferns are, giving a totally different, as well as far more beautiful habit to the plant. Of this there are a few examples in New Zealand, as the *Aspidium pennigerum* and several species of *Lomaria*, and a more striking one in the *Asp. venustum*, which presents this unexpected appearance in the high latitude (for these regions) of the 53rd degree, and is wholly due to the shade, moisture, and equable climate of the sea-level in Lord Auckland's group and Campbell's Island; for on ascending the hills, or even leaving the woods, this fern assumes the ordinary appearance of other *Aspidia*.

Although the most abundant production of Ferns is found under the physical features of shade, moisture, and a certain amount of heat, these are not on the one hand always present where the Ferns do preponderate to a great degree, nor on the other do the latter always appear where these conditions are the most evident.

The small island of St. Helena has its Flora composed of nearly equal portions of Phænogamic plants, Ferns, and other Cryptogamiæ, the Ferns forming about a third part of the whole, and nearly equalling the flowering plants; this is only to be expected from St. Helena fulfilling the above conditions in a most eminent degree. The little island of Ascension, on the other hand, about 500 miles distant, is proverbially called a cinder, with hardly water sufficient to supply a garrison composed of a mere handful of men, and absolutely but one small drip, rather than spring, in the whole island, supplied by the percolation of condensed sea-vapours on the narrow top of a hill, 2818 feet high; no shade exists any where, and the soil is porous volcanic scoriæ, that scorches the feet after being heated by a tropical sun; under all these circumstances it produces likewise as many Ferns as native flowering plants. It is true that they are confined to the top of Green Mountain, whose slopes in many places are completely covered by them, but they enjoy no shade, the only native woody plant not attaining two feet in height; and what is more remarkable, out of nine species of Ferns existing under these circumstances, only two are common to Ascension Island and St. Helena; several are peculiar to their isolated position, and one is a species of *Marattia*, a genus I believe to be in general particularly impatient of exposure. I know no parallel instance to this amongst the Atlantic islands; a far larger proportion of the ferns, both of St. Helena and of Tristan d'Acunha, is common to both these spots, and to other parts of the globe, than are those of Ascension;

and in the little island of Trinidad, in lat. 20° S., where we effected a landing with considerable difficulty, in a rocky cove which was cut off by precipices from all other parts of the island, I found the Ferns at the level of the sea in the proportion of 2–3 to the phænogamic plants, and the species were the most common Brazilian ones. This remarkable disparity between the vegetable productions of two islands so contiguous as St. Helena and Ascension, and both so remote from any other land whatever, has some analogy to what obtains in the islands of another isolated group, also situated within the Tropics, though in another ocean—the Galapagos. From the examination of an excellent herbarium formed by Mr. Darwin in three of these islands, and of some of the plants from a fourth island, as well as of those collected by Mr. Douglas, Dr. Scouler, Mr. Macrae, and Mr. Cuming, in the localities also visited by Mr. Darwin, it would appear not only that the plants of that little archipelago differ widely from those of the main land of S. America, but that its several islets possess in some cases different genera, and more often representative species. The Ferns there bear but a small proportion to the whole Flora, though a more considerable one to that of the two islands in which they are most abundant, and they are rather the common forms of the West Indies than of the neighbouring coasts of Columbia, Peru, or of Mexico.

The *Aspidium venustum*, as it grows in the low woods of Lord Auckland's group, is, for its size, among the most ornamental of Ferns, the larger tree-ferns alone excepted. In one respect it even excels those of more majestic growth, for its feathery fronds are spread out below the level of the eye, so that the beautiful symmetry of the crown, with its rich velvetty crosier-formed young leaves in the centre, is thus fully displayed.

3. ASPLENIUM, *L.*

1. Asplenium *obtusatum*, Forst. *Prodr.* n. 430. *Lab. Fl. Nov. Holl.* v. 2. p. 93. t. 242. f. 2. *Brown, Prodr.* p. 150. *Schkuhr, Fil.* v. 1. p. 6. t. 68. *Hombr. et Jacq. in Voy. au Pole Sud, Bot. Monocot. Crypt.* t. 1. A. (*sine descript.*).

Var. β. *obliquum*;—A. obliquum, *Forst. Prodr.* v. 429. *Labillard.* l. c. t. 242. f. 1. *Schkuhr*, l. c. t. 71. A. chondrophyllum, *Bertero in Herb. Hook.* A. apicidentatum*, *Hombr. et Jacq.* l. c. t. 1. A. (*sine descript.*).

Hab. Lord Auckland's group and Campbell's Island; very common on the rocks near the sea and at the margins of the woods.

All the various stages between the *A. obliquum*, Forst., and *A. obtusatum*, Forst., exist in Lord Auckland's group, and probably in other islands of which this plant is an inhabitant; one of the specimens indeed, is intermediate between the excellent delineations of the two given by Schkuhr. MM. Hombron and Jacquinot have also figured both the states (from Lord Auckland's group), retaining them under the name of "*obtusatum*," and added to the plate a representation of another, under the name of *A. apicidentatum*, which is equally abundant with the others, and I have been unable to distinguish it even as a variety; the production of the apex of the pinna into a tooth, not affording a constant character. I have not quoted the Flora of Mr. Cunningham, or of M. A. Richard, the former not having gathered this species at the time of the publication of his Prodromus, and the latter author, considering it identical with *A. lucidum*, Forst., leaves it doubtful whether he knew both species. Besides the greater size, different texture, and shining surface of the *A. lucidum*, its involucres are always very much narrower and longer in proportion to the breadth of the frond. Both are common to many parts of the southern hemisphere, and are particularly frequent in the Pacific Islands.

I have retained the name of *obtusatum* for this species, that variety being the more frequent of the two described by Forster.

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* *A. apicidentatum*, Homb. and Jacq.; this name probably applies to the pinnæ being terminated by *a* tooth; but all the pinnæ being serrated throughout their whole margin, I presume the term is not used in its ordinary acceptation.

2. Asplenium *scleroprium, Hombr. et Jacq. in Voy. au Pole Sud, Bot. Monocot. Crypt.* t. 1. D. *sine descript.*

Hab. Lord Auckland's group. (*MM. Hombron et Jacquinot.*)

On this plant I can give no information, the plate of MM. Hombron and Jacquinot being unaccompanied by any description. Some of my specimens of *A. obtusatum* approach the figure quoted above, and entirely agree with it in the form of the sori: they differ in the pinnæ being less strongly crenato-serrate. The name probably alludes to the texture of the plant, which like that of many of the southern species is remarkably thick and coriaceous.

3. Asplenium *flaccidum*, Forst.; *Prodr.* n. 426. *Presl, Pterid.* p. 106. Cænopteris *et* Darea *auctorum.*

Var. β. *Aucklandicum*, Hook. fil.; erectum, frondibus lineari- v. oblongo-lanceolatis crassis pinnatis, pinnis lineari-lanceolatis inciso-serratis, involucris a costa remotis interdum supra segmenta productis.

Hab. Lord Auckland's group; frequent on the margins of woods near the sea.

Varietas erecta, bi-tripedalis, crassa et coriacea, læte-virens, sublucida, inter *Asplenium* verum *Cænopteridemque* quasi media. *Frondes* 1–1½ ped. longæ, ½–¾ latæ, apice in laminam attenuatam basi profunde laciniatam productæ, pinnatæ. *Pinnæ* remotæ, sublonge petiolatæ, lineari-elongatæ v. lanceolatæ, crassæ, 3–5 unc. longæ, ½ unc. latæ, basi suboblique attenuatæ, superne in apicem linearem obtusam sinuatam subcaudatam productæ, per totam longitudinem regulariter profunde inciso-serratæ; laciniis linearibus, obtusis, sub ¼ unc. longis, infimis rarissime bifidis, costa crassa, latiuscula; venis simplicibus, obscuris, ad apices laciniarum percurrentibus. *Sori* latiusculi, a costa remoti, parte superiore sæpe ultra pinnam supra lacinias producto, iisque marginale. *Rachis* latiuscula, subalata, supra medio costata, subtus canaliculata, plerumque glaberrima. *Stipes* validus, crassitie pennæ anserinæ, basi curvatus et ascendens, angulatus, hinc illinc paleis rarissimis membranaceis sparsis.

This is a very handsome Fern, and, as it appears in Lord Auckland's group, very different from *A. obtusatum*, but is so closely allied to the *A. flaccidum*, a very common plant in the New Zealand Islands, that I have retained it as a variety of that plant. The pinnæ are attenuate and narrow, produced at the apex into a long caudate obtuse lacinia, they are remarkably uniform throughout the frond, but in my largest specimen the base of one of the lowest pinnæ is trapezoid, much broader than the rest, more deeply divided, with the veins sometimes forked. This, together with the remoteness of the short sori from the costa, and their frequent extension along the inner edge of the laciniæ, is what obtains in the more entire varieties of the *A. flaccidum*. The tendency to produce the sori at a distance from the costa appears to remove this species from *A. obtusatum*, Forst. and its allies, to which its regularly pinnated frond bears much resemblance, connecting it on the other hand with *A. bulbiferum*, Forst., and its inconstant ally *A. laxum*, Br., some of whose states again are very near to varieties of this. With reference to the very variable nature of some genera of Ferns, and especially of those in the islands of the Southern Hemisphere, I may here transcribe a remark made by a very acute observer of plants, Mr. James Backhouse, during his visit to Norfolk Island:* "On the rocks of the S. coast *Asplenium difforme* grows, a Fern resembling the *A. marinum* of England. At a short distance from the shore its leaves become more divided, and in the woods, in the interior of the island, they are separated into such narrow segments, that the lines of fructification are thrown upon their margins. It then becomes *Cænopteris Odontites*. But every possible gradation is to be met with between this state, and that in which it grows on rocks washed by the sea." Having no Norfolk Island specimens of these plants, I am unable to offer any further comment except that some specimens of *A. difforme* in Mr. J. Smith's Herbarium seem to confirm this view, and that Mr. Backhouse's well known accuracy entitles any observation of his to much consideration. The *A. marinum* itself has a wide geographical range, varying considerably in its several localities, and more in some places than in others; some of these I have alluded to in describing the plants of the Galapago Islands. (*MS. ined.*)

* Narrative of a Visit to the Australian Colonies, by James Backhouse.

4. PTERIS, *L.*

1. Pteris *vespertilionis*, Lab.; *Fl. Nov. Holl.* vol. ii. p. 96. t. 245. *Brown, Prodr.* p. 154.

Hab. Lord Auckland's group and Campbell's Island; very common on rocks near the sea.

These specimens, which are small, accord with others gathered in Tasmania. The veins are generally free, but in the broader pinnules the upper primary one often unites with that of the segment below it. The *P. Brunoniana* of New Zealand (A. Cunn. Prodr. Fl. Nov. Zel. in Comp. Bot. Mag. vol. ii. p. 365.), has the veins much more anastomosing, in which respect it differs from the plant of New Holland. This is also the case in specimens of a very similar plant from Brazil, the Mauritius, Juan Fernandez, and the Philippine Islands. The more simple veined species is apparently an inhabitant of New Holland, Tristan d'Acunha, and the Cape of Good Hope.

The Lord Auckland's group specimens, growing in the immediate neighbourhood of the sea, have a very succulent habit.

5. LOMARIA, *Willd.*

1. Lomaria *procera*, Spreng. *Syst. Veg.* vol. iv. p. 65. *A. Cunn. Prodr. Flor. Nov. Zel. in Comp. Bot. Mag.* vol. ii. p. 363. L. procera *var.* tegmentosa, *Hombr. et Jacq. in Voy. au Pole Sud, Bot. Monocot. Crypt.* t. 2. E. *sine descript.* Stegania procera, *Brown, Prodr.* p. 153. *A. Rich. Flor. Nov. Zel.* p. 86. t. 13, fertile frond only. Blechnum, *Sw., Lab. Flor. Nov. Holl.* vol. ii. p. 97. t. 247.

Hab. Lord Auckland's group and Campbell's Island; abundant, especially by the banks of streams and in watery places, ascending to the tops of the hills where it is very stunted.

This is the ordinary New Holland and Tasmanian form. M. A. Richard, in the Flor. Nov. Zel., gives an excellent figure of the sterile frond along with the barren state of another, probably the following, species.

2. Lomaria *lanceolata*, Spreng. *et A. Cunn. locis citatis.* Stegania, *Brown et A. Rich.*

Hab. Lord Auckland's group and Campbell's Island; in woods close to the sea abundant.

6. POLYPODIUM, *Sw.*

1. Polypodium *viscidum*, Spreng. *Sp. Pl.* vol. iv. p. 61. Cheilanthes viscosa, *Carm. in Linn. Soc. Trans.* vol. xii. p. 511. *non Link.* C. fragilis, *Carm. in Herb. Hook.* "Polypodium villoso-viscidum, *Aubert du Pet. Thouars, Flore de Trist. d'Acunha, in Mel. de Bot.* p. 44." *Carm.* l. c.

Hab. Lord Auckland's group and Campbell's Island; moist places on the hills, especially under the shelter of bushes.

My specimens entirely accord with Capt. Carmichael's in Herb. Hook. Very similar plants inhabit other islands of the Southern Hemisphere, which have been placed in *Polypodium* or *Cheilanthes*, according to the views entertained by the authors of the several species as to the nature of the recurved apices of the lobules, which, especially in a young state, cover the sori. The species most nearly allied to this are the *Polypodium viscosum* of Pritchard's 'Catalogue of St. Helena plants,' the *P. viscidum* of Colenso MSS., a native of New Zealand alluded to in a catalogue of those collected by Mr. Stephenson (vid. Hook. Lond. Bot. Journ. vol. iii. p. 413.), and a Juan Fernandez species in Herb. Hook., bearing the name of *P. spectabile*, Kaulf. ?, in Mr. Bertero's hand-writing; all these have the sori invariably placed close to the margin of the segments, in whose concave apices they are somewhat sunk. The *P. rugosulum* (Lab. Fl. Nov. Holl. vol. ii. p. 92. t. 241.), another closely allied plant, is retained in this genus by Mr. Brown (Prodr.

p. 147.), and to it the *Cheilanthes ambigua*, A. Rich. (Flor. Nov. Zel. p. 84.), seems very nearly related. M. Richard accurately describes his plant, of which I have gathered specimens near the Bay of Islands, and should be inclined to place them near to the *P. rugosulum*, Lab.; though in habit and most of the characters it approaches a true species of *Cheilanthes* or *Hypolepis*, from the interior of New Zealand, which is hitherto undescribed. Mr. Colenso's *P. viscidum*, a mountain plant, is, I believe, identical with this from Lord Auckland's group.

2. POLYPODIUM *Grammitidis*; Brown, *Prodr.* p. 107 *et auctorum.* Grammitis heterophylla, *Lab. Flor. Nov. Holl.* v. 2. p. 90. t. 239.

HAB. Lord Auckland's group; on the trunks of trees, rare.

This plant appears intermediate between the genera *Polypodium* and *Grammitis*; I have followed Mr. Brown in retaining it in the former of these. The Auckland Island specimens do not differ from those of New Zealand and Tasmania.

7. PHYMATODES, *Presl.*

1. PHYMATODES *Billardieri*, Presl, *Pterid.* p. 196. Polypodium Billardieri, *Brown, Prodr.* p. 147, *et auctorum.* P. scandens, *Lab. Nov. Holl.* vol. ii. p. 91. t. 240. P. phymatodes, *A. Rich. Fl. Nov. Zel.* p. 66.

HAB. Lord Auckland's group and Campbell's Island; common on trunks of trees and rocks in the woods near the sea.

The Auckland group specimens are equally variable with those of New Zealand and Tasmania.

8. GRAMMITIS, *Sw.*

1. GRAMMITIS *australis*, Brown, *Prodr.* p. 146. *A. Cunn. Flor. Nov. Zel.* l. c. p. 362. *Hombr. et Jacq. in Voy. au Pole Sud, Bot. Monocot. Crypt.* t. 2. G. G. Billardieri, *Willd. Sp. Pl.* vol. v. p. 139. *Presl, Pterid.* p. 209. G. rigida et G. humilis, *Hombr. and Jacq.* l. c., t. 2. fig. F. and H.

HAB. Lord Auckland's group and Campbell's Island; very common in all situations, from the level of the sea to the tops of the mountains.

A copious suite of specimens, collected at different levels, from the sea to an altitude of 1400ft., prove all the three species figured by MM. Hombron and Jacquinot to belong to states of one plant. The same varieties are found on ascending Mount Wellington in Tasmania, where also they pass insensibly into one another. I have retained Mr. Brown's name for this species, the name *G. Billardieri* having been already applied to another of the genus, and I am not aware whether the 'Prodromus Floræ Novæ Hollandiæ' or Willdenow's 'Species Plantarum' appeared first in the year 1810.

9. SCHIZÆA, *Sw.*

1. SCHIZÆA *australis*, Gaud. *Flor. Ins. Mal. in Ann. Sc. Nat. Maie.* 1825, p. 98 *et in Freyc. Voy. Bot.* p. 296. S. palmata, *Hombr. et Jacq. in Voy. au Pole Sud, Bot. Monocot. Crypt.* t. 4. Z. *sine descript.*

HAB. Lord Auckland's group; upland places, very common on the hard soil, which is often bare of any vegetation but *Lichens.*

These specimens entirely accord with the description of M. Gaudichaud's *S. australis*, quoted above: the figure of MM. Hombron and Jacquinot not affording any character to distinguish their *S. palmata* specifically from this, and no letter-press having accompanied their plates, I feel obliged to set aside the name they have adopted.

10. LYCOPODIUM, *L.*

1. LYCOPODIUM *scariosum*, Forst. *Prodr.* n. 484. *Spr. Syst. Veg.* vol. iv. p. 18. *Hook. and Grev. in Bot. Misc.* vol. ii. p. 388. L. Jussieui, *Desv. Encycl. Bot. Suppl.* vol. iii. p. 534. *Willd. et auctorum.* L. reptans, *Banks and Sol. MSS. in Bibl. Banks.*

HAB. Lord Auckland's group; in woods, *D. Lyall, Esq.*

Sir J. Banks and Dr. Solander it would appear were amongst the original discoverers of this species, though it is of so general occurrence throughout many parts of the tropics, as very probably to exist in some of the older Herbaria. Forster's name seems to have been entirely overlooked by botanists; it is attached to a specimen, preserved in the British Museum, of the plant now well known under the name of *L. Jussieui* Desv., a very widely diffused species, especially throughout the S. American continent. Mr. Colenso has collected it in the mountainous interior of the northern island of New Zealand, and Sir J. Banks and Dr. Solander in Admiralty Sound. There exist, in Herb. Hook., South American specimens from as far south as Valdivia, and also from Peru, New Grenada, and Jamaica, where it appears to be abundant, varying slightly in habit, being sometimes suberect or ascending, but more generally having a long trailing caudex, which sends up erect branching stems.

The *L. scariosum* belongs to a small section of the genus, whose natural position is between the two great groups, namely, that with the leaves imbricated all round the stem, and that in which they are stipulate, distichous, and more or less of a membranous texture. The spikes of this section are generally pedunculate and often branched, as in this species and *L. complanatum*, L.; but sometimes sessile, which is the case with *L. decurrens*, Br.; in the former character, as in the coriaceous foliage, often indistinct stipules and arctic, alpine or temperate habitats, this section differs from the tropical distichous-leaved division to which the form of foliage approximates it. Like most natural groups, the limits of this cannot be very strictly defined; Mr. Brown's *L. decurrens* has the sessile spikes of the tropical species of *Selaginella* and some states of *L. complanatum*; approaching forms of *L. Alpinum*, D., pass into the imbricated ones. The allies of *L. scariosum* are few; I am acquainted with the following; 1. *L. decurrens*, Br., only known as an inhabitant of the Alps of Van Diemen's Land; 2. *L. complanatum*, L., this is a very widely diffused plant throughout the temperate and arctic regions of Europe, Asia, and America; we possess specimens of a very similar, if not the same species, from upper India and the Peninsula of Hindostan, as also from Jamaica, from Mexico, Columbia. Peru, Caraccas and Brazil, it is the *L. thuyoides*, H. B. K.; 3. *L. volubile*, Forst., a very common New Zealand species this and the two following have compound panicles of spikes, with elongated and spreading branches; 4. *L. filicaule*,* (vid. infra); 5. *L.*† *comans*, (vid. infra); 6. *L. Wightianum*, Wall., some states of this have the leaves towards the

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* *L. filicaule*, Hook. fil.; vage ramosum, caule gracillimo nudo tereti valde ramoso, ramis divaricatis patentibus filiformibus compressis foliosis utrinque stipulatis, foliis alternis oppositisve linearibus longe decurrentibus parte superiore solum libero curvato subulato apice pilifero, stipulis parvis raris piliferis, pilis diaphanis, spicis plurimis pedicellatis paniculatis inclinatis v. pendulis, squamis late ovatis acuminatis.

HAB. Upper India. Moflong fir forest Khaisya Hills, *Mr. Griffiths.* A very fine species; the branches are of a dusky red color when dry; the ultimate ones, with the leaves, 1 line across. The panicles of spikes are lateral, 3–4 inches long and spreading; the spikes themselves, $\frac{1}{4}$–$\frac{1}{2}$ inch long, generally curving.

† *L. comans*, Hook. fil.; pendulum, caule dichotome ramoso tereti hinc illinc cicatricato nudo v. foliis diaphanis sparsis, ramis longissimis pendulis gracilibus flaccidis pluries divisis valde compressis utrinque stipulatis foliosis, foliis distichis suboppositis alternisve longe linearibus per totam fere longitudinem decurrentibus coadunatis apicibus solum liberis acutis, stipulis scariosis raris, spicarum paniculis lateralibus valde ramosis, ramis pedicellisque teretibus foliis sparsis lanceolatis scariosis obsitis, spicis longe pedicellatis arcuatis, squamis ovatis in laminam erosam scariosam diaphanam productis.

apices of the branches quadrifarious, in others they are so almost throughout the branches, it is probably not different from,—6. *L. alpinum*, in which they are sometimes distichous, when the more sessile spikes alone distinguish it from *L. complanatum*. The quadrifarious disposition arises from the stipules becoming leaves. Of other species, referred to this section in the Botanical Miscellany (l. c.), there are no specimens in Herb. Hook. *L. alpinum* I have mentioned as perhaps a doubtful species of this section, its leaves being sometimes imbricated even in more than four series; in some Norway specimens the spike-bearing branches are elongated and become rather bare of leaves, which are also more appressed, thus exhibiting a manifest approach towards some species with pedicellate fructification. It may further be remarked that *L. complanatum* is not a British, and *L. alpinum* hardly an American plant.

The leaves of *L. dendroideum*, Mich., a species apparently confined to North America, are sometimes partially distichous; they are not, however, coadunate with the branches, as in this group.

2. Lycopodium *clavatum*, L., *var.*—L. magellanicum, *Swartz Syn. Fil.* p. 180. *Willd. Sp. Pl.* vol. v. p. 15. *Gaud. Fl. Ins. Mal. in Ann. Sc. Nat.* vol. v. p. 98, *and in Freycinet, Voy. Bot.* pp. 130 and 282. *D'Urv. Fl. Ins. Mal. in Mem. Soc. Linn. Paris,* vol. iv. p. 597.

Hab. Lord Auckland's group and Campbell's Island; on the hills, not uncommon, but only found at a considerable elevation.

These specimens differ in no respect from others which I have gathered in the Falkland Islands and on Mount Wellington, Tasmania, and have considered to be the *L. fastigiatum*, Brown, (Prodr., p. 165). The Falkland Island plant, which is also common in Antarctic America, varies from one to many inches in height. The caudex is ascending or creeping, often one to two feet long, naked or clothed with leaves; the branches are erect and divide in a panicled form, and are copiously leafy; the leaves are subacute or acuminated, always more or less curved, but are at some times much more numerous than at others. In starved alpine specimens the spikes are solitary and often sessile: as the plant inhabits lower levels and more favourable situations its peduncles elongate, fork or branch, and bear two or more spikes: the spikes themselves vary from $\frac{1}{4}$ to 2 inches long, with the scales ovato-lanceolate, acuminate, rather variable in length, and more or less recurved.

The species of *Lycopodium* are liable to great variation, as a copious suite of any one will readily show; many of them have been examined and characterized with reference to the country they inhabit and their congeners in that country, and have not been compared with the whole genus. As our collections increase, specimens are constantly presenting themselves, which tend to unite the species of two distant localities; partly because they partake of the characters of both, and also because, coming as many do, from intermediate stations, they strengthen the supposition that such are mere forms of one widely diffused plant. It is seldom that a collector has the time, and few have the inclination, to preserve such a series of specimens from one locality, as will give any idea of the amount of variation a species may be liable to, in a limited area: on the other hand, the extreme varieties are collected as two different species, and a future author is often obliged to describe as a third an unrecorded state of what actually exists in both situations. The *L. magellanicum*, Sw., presents a case in point. In the Falkland Islands, states of it are not unfrequently met with in all respects resembling the *L. clavatum*, excepting that the leaves are not

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Hab. Philippine Islands; *Cuming*, no. 2346.

A very fine species. Branches 1–2 feet long, about a line broad, lurid red. Leaves 2 lines long, wholly consolidated with the branch, except their apices, which are sometimes free and acute, or more rarely with a diaphanous point. The stipules are often irregularly placed, generally with long diaphanous acuminated apices, appressed to the branch. The pedicels of the spikes and branches of the panicle have leaves similar to the stipules. Panicles 3–4 inches long, their pedicels about an inch; the spikes curved, about $\frac{3}{4}$ inch, their scales with long suberect or patent diaphanous apices.

piliferous at the apex; so close indeed is the resemblance in habit that M. D'Urville has remarked, "Je possède un échantillon de Gaudichaud, double de taille, et voisin de notre *L. clavatum*." Such being the case, should *L. clavatum* be seen to vary in this respect, and especially if it is found to inhabit all intermediate latitudes between its northern habitats and Fuegia, we shall be obliged to conclude either that the plants are the same, or that *L. magellanicum* may be so sportive as to assume a form undistinguishable from the European plant. The former of these conclusions is generally admitted in such cases. The limits within which a species varies are acknowledged to be wider in one locality than in another, and two closely allied individuals may be modified almost infinitely without running into one another, as it is called; but, since the knowledge of specific difference is limited to the powers of observation, which are only attainable by the microscope, we are forced to acknowledge it possible that two totally different plants, inhabiting widely separated countries, may present to our senses a precisely similar appearance and remain undistinguishable; a conclusion which, if acted upon without caution, would lead to the subversion of all our confidence in what are universally confessed to be well established species.

The acute-leaved *Lycopodia*, which are not piliferous at the apex and otherwise closely allied to the *L. magellanicum*, are *L. fastigiatum*, Br., and *L. Pichinchense*, Hook. (Ic. Pl. t. 85), the latter certainly is, and probably the former also, a state of or identical with this; both of them, though inhabiting a lower latitude, are only found at a great height. From Owyhee we have *L. heterophyllum*, Hook. (Ic. Fil. t. 113), in which the leaves are some of them simply acute as in the more southern form, but others piliferous and ciliated or erose at the margin, the former a very constant character in the *L. clavatum*, and the latter sufficiently obvious in some states only of that plant; in other respects this is not to be distinguished from the above or from a very common Chilian species, whose leaves have long acuminated points, and which seems identical with the *L. dendromorphum*, Kunze; of this, however, I have only seen barren specimens, evidently passing into the *L. aristatum* of the tropics, a very widely diffused and generally acknowledged variety of *L. clavatum*. Many states of *L. clavatum* are enumerated by Mr. Spring, in his account of the Brazilian *Lycopodia*, (vid. Regensburg Flora, 1838).

The last named author seems to have described from copious suites of specimens, and to have arrived, in most points, at the same conclusions with myself; thus, he has found it necessary to combine the *L. alopecuroides*, L. and *L. longipes*, Hook. and Grev., with *L. inundatum*, L., to which must be added *L. Mathewsii*, Hook. (Ic. Pl. t. 26), and perhaps *L. contextum*, Mart. (Fl. Bras. Crypt. vol. i. p. 38, t. 23, f. 1.), these species I had considered as merely forms of one, before Mr. Spring's paper was pointed out to me. The *L. carolinianum*, L., accompanies the last mentioned species throughout the temperate and warm parts of the American continent, and has also a very wide range through other countries, having been found in Tropical and South Africa, the East Indies, Madagascar, Tasmania, and New Zealand; these two constitute part of a natural section allied to the *Clavatum* group in the spiked, more or less pedunculate fructifications, and ascending direction of the leaves on the prostrate stems, and to the *Complanatum* division in the tendency of the leaves of *L. carolinianum* to become distichous and decurrent, the other species of it are *L. selaginoides*, L. and *L. pygmæum*, Kaulf. A third group of species, which, like the former, have cylindrical spikes, contains—1. the *L. annotinum*, L., a species spread over all temperate and Northern Europe, Asia, and especially America, where it is found as far south as the Alleghany and White Mountains. There are what appear barren specimens of this in Hook. Herb. from Dr. Wallich, under the MS. name of *L. Heyneanum*. In South America *L. annotinum* is represented by a more slender but very nearly allied plant, whose spikes are sometimes bifid and spuriously pedunculate; it is Hartweg's 1474 and 1479 from Colombia, where it has also been gathered by Professor Jameson.—2. *L. diaphanum*, Sw., this is a Tristan d'Acunha species, very distinct in the form of the scales of the spikes and long piliferous apices of the leaves.—3. *L. sericeum*, Mst., this is the *L. scariosum*, Hook. (Ic. Pl. t. 87, *note*), from Peru, one of the most beautiful species of the genus. I know of no others very closely allied to these, they rank near the *Clavatum* group, from which indeed they only differ in the truly sessile spikes, and also approach that containing *L. complanatum*, through *L. alpinum*, whose spikes are sessile.

The *L. cernuum*, L., may be considered as the type of another natural section, it is perhaps the most abundant

species of the genus, throughout the tropics especially, probably covering more space than any two others. There are specimens from no less than fifty different stations and seventy collectors, preserved in the Hookerian Herbarium; its northern limit seems to be lat. 39°, where it is found in the Azores Islands, and its southern the Cape Colony; this, like several other very widely diffused species, does not inhabit the Australian continent, so far as I am aware. The following species should rank with it,—2. *L. pendulinum*, Hook. (Ic. Pl. t. 90).—3. *L. tortum*, Sieber.—4. *L. densum*, Lab.—5. ? *L. dendroideum*, Mich., this species is of rather dubious affinity and should perhaps be more properly placed in the *Complanatum* group, the branches being spread out in a flabellate manner, the whole frond very compressed or plane, and the leaves having a tendency to become bifarious; the latter are described as "being 4–6 fariously disposed, with those of the under surface smaller than the rest," (vid. Bot. Misc., vol. ii. p. 386), this is always the case, but at the same time those both on the upper and lower surface of the branches are appressed whilst the lateral spread, and the lower are often so small as to partake of the nature of stipules. All the species of the *Cernuum* group are robust in habit, erect, generally tall, copiously branched with their branches spreading on all sides; the spikes are sessile and very numerous, their mode of growth suffices to distinguish them from those of the *Annotinum* section.

The four groups above enumerated contain most of the imbricate-leaved species with uniform capsules arranged in terete spikes; they are I believe strictly natural, though all are not founded upon characters of equal value. One species, more nearly allied to some of the above than to any of the other great divisions of the genus, stands very much by itself, the *L. laterale*, Br. (Mr. Brown's *L. diffusum* being possibly a variety of it), in which the spikes are placed upon such very short branches as to appear truly lateral; in this respect, as in their obscurely angular form, it approaches some of the distichous-leaved group, but the habit is totally dissimilar and the foliage like that of *L. inundatum*, var. *Alopecuroides*.

3. Lycopodium *varium*, Brown, *Prodr.* p. 165 *et auctorum*. L. pachystachyon, *Desv. Encycl. Meth. Suppl.* vol. iii. p. 544.

Hab. Lord Auckland's group and Campbell's Island; very common in the woods.

Under the former species I enumerated the different groups into which those of this genus with leaves imbricated round the stem and terete spikes arranged themselves; they form, together, one of the large primary divisions of *Lycopodium*; they are inhabitants of the cold as well as of the tropical parts of the globe, generally assuming, as they approach the equator, a larger growth and more robust habit, both the individual species peculiar to the low latitudes, and the varieties of those which equally inhabit the polar regions, being more fully developed within or near the tropics. There they are not replaced by the distichous-leaved group, but under most conditions are equally abundant with them. Throughout all changes of temperature and varieties of exposure, the scales of the spike never exhibit any tendency to become foliaceous; nor do they possess capsules in the axils of the leaves.

There are, however, other *Lycopodia* whose fructifications are as manifestly spicate as the last, and which accompany them through all climates, but whose spikes are angular and the scales not materially different from the cauline leaves; these, in passing from a temperate to a warmer parallel, gradually lose their spicate character, the capsules appear equally in the axils of the upper leaves and in the spikes, the latter become gradually reduced and at length obliterated, when the fructifications are wholly axillary: under excessive heat and moisture, the same effect is produced by the prolongation of the axis beyond the apex of the spike, into a leafy branch, similar to the lower parts of the stem, and at the same time the conversion of the scales into ordinary leaves. A third modification is presented in those whose spikes divide or branch. Here there is a blending of the two divisions *Selago* and *Phlegmaria*, through *L. varium* and its allies, which together, I consider to form one natural group; and it is further to be remarked, with regard to them all, that these modifications of the inflorescence are not only the effects of latitude and climate, but that one species seems to assume all these appearances in a single locality, which in other parts of the globe is invariable through a considerable area; and that the causes of the change

are at one time quite latent and at another conformable to our ideas of the effects of temperature and local circumstances. It is not only in the inflorescence that this group is liable to vary, but one form passes into others by the modifications of many of its organs at once, and this to so great an extent as to render it extremely difficult to define any one species between the two extremely dissimilar forms of *L. Selago* and *L. Phlegmaria*. Want of space obliges me here to confine my attention to the phases under which *L. varium* occurs; these are so remarkable and were so wholly unexpected, that if we agree to consider such plants to be the same species as only offer forms undistinguishable to our senses, it will follow that the most of these supposed species must merge into one, and that *Lycopodium Selago* is perhaps the most variable plant in the world.

L. varium, in Lord Auckland's group and Campbell's Island, is one of the finest of the genus; it grows nearly erect on the bare ground, to a height of 1–2 feet, branching upwards, copiously leafy, with large spreading leaves, bearing at the apices of the branches numerous pendulous or drooping tetragonous spikes 2–4 inches long. The stems of this species are often nearly the thickness of a swan's quill with spreading leaves as broad as the middle finger; I have no where seen handsomer specimens of it than this island presents, and more constant ones, for it is confined to the woods, and does not ascend the hills, neither varying in the narrow belt it inhabits nor seeking other localities where it would be exposed to the influence of exciting causes. The case is very different in Tasmania, where it also grows very commonly in the subalpine woods, and from whence I have specimens of *Lycopodia* presenting all intermediate stages between this and *L. Selago*, the connecting links being similar to what have been considered different species in other parts of the globe. Form and habit alone have not induced me to unite such dissimilar plants, for I have in vain sought with the microscope for diagnostic characters. The smallest Tasmanian specimens have been published as *L. Selago* (Hook. and Grev. in Bot. Misc., vol. iii. p. 104), they are about five inches high, simple at the base, branching upwards, in all respects similar to the American and European plant; they are likewise copiously supplied with gemmæ, giving a squarrose appearance, these were first observed on the North-west American specimens of *L. Selago*, but are now known to be common on this species even in Scotland, where a variety occurs with small very acuminated leaves, those of the gemmæ being sometimes much altered, broadly obovate-oblong, acute, and keeled on the back. In the next stage of the Tasmanian plant, the stem ascends from a curving prostrate base, is about 5–6 inches long, the lower leaves are linear, acute or acuminate, patent or subsquarrose, subserrulate towards their apices, obscurely nerved in the middle, the upper leaves are generally appressed for nearly the whole length of the stem, lanceolate or ovato-lanceolate, acuminate, acute or subacute, obscurely nerved, the margins cartilaginous with obsolete serratures: this form is quite identical with others of *L. Selago* from Cumberland, as well as with many from North Europe, Asia, and America. The two first described states inhabit exposed places, the following (the third), which grows on rocky places on the margins of woods, has the stems a foot or more high, branching, much curved and ascending at the base, sparingly branched above; the leaves, except towards their apices, are patent or subsquarrose, larger and more loosely placed than in the former, with the nerve more thickened, those at the summits of the branches are similar to the leaves of the second state but more distinctly serrated. *L. Selago* of Tasmania resembles *L. suberectum*, Lowe, of Madeira and other warmer parts of the northern hemisphere, in which the leaves are generally all squarrose, nearly entire or strongly ciliate at the margins; this is such a form as a species, in passing from a colder to a more genial temperature, might be supposed to assume. In the fourth stage of the Tasmanian plant the leaves become larger, more patent or subreflexed, coriaceous and shining, still they are more or less acute, and the capsules are wholly axillary, sometimes confined to the middle of the branch, at others to the upper portion, which looks rather different from the lower and indicates the transition to *L. varium*. This state is nearly allied to some Indian forms of the genus, as also to *L. lucidulum*, Mich., which varies in the serratures of its leaves and in other particulars approaches very near, if it does not absolutely merge into American forms of *L. Selago*. Nor is it to be distinguished from Ceylon and Tristan d'Acunha specimens of *L. insulare*, Carm., which further passes into *L. crassum*, Hook. and Grev., and through it into some other South American species.

The remaining Tasmanian states of *L. Selago* may be considered as belonging to *L. varium*; in the fifth of these

(from the small one with which I commenced), the stout stem becomes naked below, sparingly leafy upward, with long, linear, coriaceous, acute or obtuse leaves, the capsules are both axillary and spicate, but the spike is interrupted, the scales being at one time small, and at another foliaceous. This approaches the *L. taxifolium*, Sw., and *L. linifolium*, L., natives of various parts of the world, also *L. gnidioides*, L., Cape specimens of which differ from the normal state of *varium* only in having axillary capsules, whilst in other localities it becomes pendulous and spicate; and so with regard to the *L. Flagellaria*, Bory, of New Zealand, which I cannot distinguish, except by its mode of growth, from *L. varium*. To dwell at length upon all the varieties of this species would be out of place here, and occupy many pages; the transitions from it to *Phlegmaria* are not obscure, the variations of that plant being excessive.

The importance of the question, "whether two perfectly similar plants, from remote quarters of the globe, are to be considered as belonging to one species," has induced me to canvass very fully the claims of many supposed forms of *Lycopodium* to the title of distinct species. In all such cases, my first object has been to determine whether the plant inhabits various intermediate countries. When, as is the case with *Callitriche verna* (p. 11.), *Montia fontana* (p. 13.), *Gentiana prostrata* (p. 56, in note), *Myosotis fulva* (p. 57, note), and *Trisetum subspicatum* (p. 97.), they are found to do so, there need be little hesitation in referring them, after due examination, to one plant; in such instances, the supposition of a double creation of the same species, or of one of them being a variety of some other really distinct plant, which plant wholly resembles another from other countries, would be confessedly a gratuitous assumption. Where however no intermediate stations can be detected, these suppositions become more plausible; the only alternatives to such conclusions being, 1st, the possibility of the species being destroyed in the intervening positions which it may formerly have inhabited; 2nd, the great improbability that the seed has been carried at once from one polar region to the other; or, lastly, what I have endeavoured to establish with regard to *Lycopodium varium* and *Selago*, that the species does exist in all intermediate latitudes, but in a hitherto unrecognised form; a circumstance the less to be wondered at on many accounts, and the following in particular. Our daily increasing knowledge of Ferns proves that the species are infinitely more widely distributed than has been supposed. The several species being variable in limited areas, it is to be expected that the amount of variation should increase proportionally with the space they cover; because the individual species of many widely distributed genera, as *Lycopodium*, have often themselves wide ranges; because the lower we descend in the scale, according to which all known vegetable productions are now arranged, the more universally we find the species scattered over the surface of the globe; and lastly, the minute size and abundance of the sporules of *Lycopodium* are favourable to their extended dispersion.

ACOTYLEDONES.

XXXIII. MUSCI.

(By W. Wilson*, Esq. and J. D. Hooker.)

1. ANDREÆA, *Ehrh.*

Theca quadrifida, rarius octofida; valvulis apice operculo persistente connexis. *Calyptra* mitræformis. *Vaginula* apophysiformis, setam brevissimam occultans, demum stipitata.

The peduncle, which elevates the mature capsule in this genus, is nothing more than an elongated receptacle (*pseudopodium*, Brid.) of a white colour; such as is also found in *Sphagnum*. In an early stage, this receptacle scarcely differs in appearance from that of other mosses; by its subsequent elongation the theca is elevated, generally above

* I here most gratefully acknowledge the invaluable assistance afforded me in the more complete determination, and in the diagnoses and descriptions, of the mosses, by our old and valued friend William Wilson, Esq., of Warrington; whose accuracy in botanical, and especially in microscopical investigation, and knowledge of this tribe of plants, are beyond praise.—J. D. H.

the perichætial leaves, whilst the true pedicel or seta remains wholly included in the vaginula. The calyptra hence continues attached to the vaginula for a much longer period than in other genera, and its rupture is occasioned by the distension of the theca; and not by an elongation of the seta. If a very young capsule be longitudinally divided, the seminal sac will be seen lining its interior, and also extending over the surface of the columella, the apex of the latter being attached to the summit of the operculum. The sporules, in a very early stage, are aggregated in fours, and long before the bursting of the calyptra attain a deep brown colour.

The inflorescence is usually, and perhaps invariably, monœcious, the male fructification being on separate branches; though *A. mutabilis* (nobis) appears really dicœcious. Both kinds of flowers are, at first, truly terminal, though, owing to the rapid growth of innovations, especially on the male surculi, they soon become, to all appearance, lateral and even axillary. The male flowers, from their small size, are, in general, concealed by the cauline leaves. The antheridia vary in number, from one or two to seven, intermixed with paraphyses, which, however, have not been seen in *A. mutabilis* (nobis), and which that species probably wants. In the female flower the archegonia are generally four, never more, and are not accompanied with any paraphyses.

1. Andreæa *nitida*, Hook. fil. et Wils.; caulibus suberectis laxe cæspitosis parce ramosis, foliis erecto-patentibus ovato-oblongis obtuse apiculatis concavis enerviis nitidis marginibus reflexis, perichætialibus paulo longioribus erectis. (Tab. LVII. fig. III.)

Hab. Lord Auckland's group; on rocks near the tops of the hills, at an altitude of 1200 feet; very rare.

Caules semi-unciales et ultra, crassiusculi, sub $\frac{1}{2}$ unc. lati, hic illic divisi. *Folia* suberecta, conferta, imbricata, sublingulata, obtusa, summo apice apiculata, dorso convexa, subcarinata, margine superne apiceque subreflexa, puniceo-atra, luce obversa rufo-brunnea, siccitate erecta, vix crispata; *perichætialia* subsimilia, sed longiora, tenera, marginibus planis, areolis minimis subrotundatis. *Inflorescentia* terminalis, dioica? *Flores masculi* gemmiformes, ovati, acuti, denique laterales, foliis caulinis dimidio breviores, foliis valde concavis ovato-rotundatis acutis occlusi; *antheridia* 6 aut plura, paraphysibus paucis filiformibus immixta. *Flores fœminei*: *Archegonia* quatuor, paraphysibus nullis. *Pedicellus* (seu *pseudopodium*) $\frac{1}{15}$ unc. longus, perichætii dimidio longior, v. rarius eo inclusus, apice (ad vaginulam propriam) incrassatus. *Theca* sessilis, parva, elliptica, nigro-fusca, 4-valvis, siccitate dilatata, $\frac{1}{8}$ lin. longa.

A highly remarkable species, and quite unlike any hitherto described.

Plate LVII. *Fig.* III.—1, a tuft, of the natural size; 2, branch and theca; 3 and 4, leaves; 5, a moist theca; 6, an archegonium:—*magnified.*

2. Andreæa *acutifolia*, Hook. fil. et Wils.; caulibus fastigiatim ramosis, ramis apice ramulosis, foliis erecto-patentibus incurvis rigidis lanceolato-subulatis acutis v. ovatis longe acuminatis concaviusculis enerviis basi inæqualibus siccitate erectis, perichætialibus elongatis lanceolatis convolutis, theca subexserta.

Hab. Campbell's Island; on rocks, barren.

Caules erecti, conferti, ramosissimi, $\frac{1}{2}$ unc. longi et ultra, siccitate rigidi. *Folia* undique inserta, patentia, deinde incurva, ovata, acuminata, basi gibbosa, enervia, infra medium denticulata, siccitate subappressa, opaca, rufo-brunnea, juniora flavo-viridia v. rufescentia, areolis pellucido-punctatis moniliformibus; *perichætialia* submajora, lanceolata, erecta. *Flores masculi* gemmiformes, foliis ovatis concavis inclusi. *Antheridia* 4–7, *paraphysibus* filiformibus $\frac{1}{2}$ breviora. *Pedicellus* perichætium vix superans. *Theca* parva, nigra, paulo exserta. *Sporæ* majusculæ, ferrugineæ.

This species may be distinguished from *A. alpina* by its narrower and much more acuminated leaves, which are of a paler hue, never shining, gibbous at the base; those of the perichætium do not differ materially from the cauline ones. The specific character and description are drawn up in part from Hermite Island (Cape Horn) specimens;

BRANCH OF THE ASIATIC SOCIETY

I

A. subulata γ.

II

A. mutabilis.

III

A. nitida.

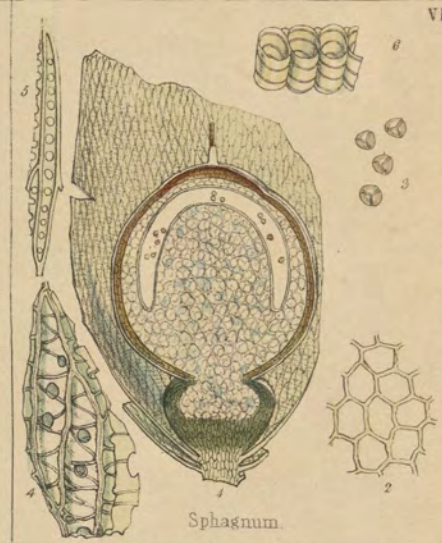
IV

S. octoblepharum.

V

S. purpurascens.

VI



Sphagnum.

VII

O. angustifolium.

VIII

O. crassifolium.

IX

D. crispulus.

W. W., J. D. H., & W. F. del.t

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those now before us, from Campbell's Island, are smaller, less branched and various in colour, sometimes forming small dense tufts, hardly $\frac{1}{4}$ inch in height, but not different in other respects.

3. ANDREÆA *mutabilis*, Hook. fil. et Wils.; caulibus cæspitosis elongatis ramosis gracillimis, foliis confertis laxisve erecto-patentibus rarius falcato-secundis lanceolatis ovato-lanceolatisve subconcavis enerviis siccitate appressis.

Var. β, *microphylla*; foliis minimis ovato-lanceolatis. (TAB. LVII. fig. II.)

HAB. Lord Auckland's group; on rocks, at an elevation of 1200 feet; rare, (with female fructification). Campbell's Island; on the hills, in rocky places, from 800–1000 feet of elevation, with male inflorescence only.

Muscus polymorphus, cæspitosus. *Caules* semi- ad bi-unciales, inferne nudi, superne ramosi. *Folia* basi macula flava notata, dorso vix papillosa, areolis granuloso-punctatis. *Inflorescentia* dioica; *folia perigonii* ovato-rotundata, acuta, concava. *Antheridia* 3 v. plura, elliptica, majora longiusque pedicellata quam in affinibus. *Paraphyses* nullæ. *Folia* perichætialia caulinis longiora, elliptico-lanceolata, convoluta.

This species, of which we have no examples in good fruit, differs from *A. rupestris* in the more erect and narrower leaves. The specific character has been drawn up from an examination of Falkland Island specimens, as well as of those from the Islands now under consideration. The other varieties are enumerated in the London Journal of Botany (vol. 3. p. 536.).

PLATE LVII. *Fig.* II.—1, a tuft of the natural size; 2, a branch; 3 and 4, leaves:—*magnified.*

4. ANDREÆA *subulata*, Harvey; caule subramoso, foliis falcato-secundis subulatis attenuatis basi dilatatis crassinerviis, perichætialibus convolutis. A. subulata, *Harvey in Hook. Ic. Plant.* vol. iii. t. 201.

Var. γ, *perichætialis*; theca foliis perichætialibus minoribus immersa. (TAB. LVII. fig. I.)

HAB. Lord Auckland's group and Campbell's Island; upon rocks, at a considerable elevation on the hills.

The cauline leaves of this variety are longer and more strict than in the other states of the plant enumerated in the 'London Journ. of Botany' (l. c.), and the theca and perichætium very inconspicuous; we cannot however venture to separate it as a species. It differs from *A. Rothii*, its nearest ally, in the leaves being longer and the nerve thicker, the latter occupying the whole breadth of the leaf, except at the base, so as to have been overlooked, and the leaves consequently described as nerveless.

PLATE LVII. *Fig.* I.—1, specimens of the natural size; 2, a branch; 3 and 4, cauline leaves; 5, section of ditto; 6 and 7, perichætial leaves; 8, a theca:—*magnified.*

2. SPHAGNUM, *Dill.*

Theca globosa, stomate nudo exannulato. *Columella* apice libera, abbreviata. *Calyptra* medio rupta, basi persistente. *Vaginula* apophysiformis, pedicellum brevissimum occultans, demum stipitata. *Perichætium* laterale.

Bridel, supposing this genus to be destitute of a *vaginula*, constituted it a separate order; in which he was followed by Bruch and Schimper.

The female flower, at first sessile, in every respect like that of other pleurocarpous mosses, occupies the place of a ramulus, or is inserted in the axis of two or more branches. As the fructification advances, the receptacle elongates, and the perichætial leaves, becoming separated from one another, it presents the appearance of a lateral branch. The antheridia are found in the fertile plant at the clavate and often discoloured extremities of short deflexed ramuli.

They are roundish, on pedicels as long or longer than themselves, generally solitary in the axils of the perigonial leaves, which are somewhat ventricose at the base, but not otherwise different from those of the stems.

The anatomy of the theca of *Sphagnum* is very peculiar. What appears the columella does not extend, as in other genera, to the summit of the theca, but is a continuation of the seminal sac, ascending from the bottom of the theca, and forms a portion of the same membrane which also lines the under surface of the operculum, passing completely across the stoma, as shewn in Plate LVII. fig. VI., where the central figure is drawn from a sketch and section prepared by Mr. Wilson.

This curious structure of the seminal sac is quite different from what obtains in most genera of mosses, and appears to have been misunderstood by Arnott and Greville, in whose excellent essays upon the 'Genera of Mosses,' the columella is described as sinking, along with its opercular membrane, so low, as to assume the appearance of a tympanum, stretched across the interior of the theca, a little below its base (Wern. Trans. vol. iv. p. 131.); their figure however does not represent the columella bearing any residua of the opercular membrane, but merely having the base of the seminal sac drawn up into the axis of the theca in the form of a cone, which is its true origin. The more striking peculiarities of the sporular sac of *Sphagnum* are these; 1st. its forming a bag or cyst without any orifice: 2nd, in the drawing up of the base of this bag into the axis of the theca, but not so far as to reach the level of the stoma, nor consequently the upper surface, or that opposite the base, which remains entire and stretched across the stoma. If the columella were carried up to the same height as in other mosses, an obliteration of the upper part of the sporular membrane would be caused by the perforation of the latter, (if we regard the metula as a portion of the columella), or else there would ensue a mutual cohesion of the membranes of columella and sac.

Sphagnum may be considered to possess the simplest form of sporular sac, the dehiscence of which is probably caused by a removal of the upper portion in the same plane as the stoma and parallel to the operculum. The next stage of development of this organ is, perhaps, presented in some astomatous mosses; *Voitia**, for instance, a perpendicular section of the theca in which genus exhibits the seminal sac in the form of a vertically elongated ring, supported in the axis of the theca by the corculum of the columella. The latter passes uninterruptedly from the apex of the seta to the top of the persistent operculum, thus apparently perforating the sac, by whose inflected walls it is lined for the greater part of its length. In this case, dehiscence and the escape of the sporules may be supposed

* In the young state of *Voitia hyperborea*, of which (through the kindness of Sir James Ross), I have examined many thecæ, there is a communication between the seminal sac and the lining of the walls of the theca (thecal membrane), by means of conferva-like filaments such as are seen in most other mosses. Tracing the different membranes upwards, from the apex of the theca, I was led to believe that the same tissue formed the thecal membrane, the conferva-like filaments, and the corculum of the columella; and further, the immediate communication between all the surfaces of the seminal sac and the walls of the theca afforded room for a conjecture, that the latter were immediately concerned in the development of the sporules, especially as before the separation of the spores both the thecal membranes and filaments were full of a grumous fluid, which afterwards disappears. If such a view be correct, the internal structure of the theca of *Voitia* is very simple, and consists, 1st, of stout cells forming the external walls; 2nd, of a fine tissue, not only lining the former and sending filaments to the opposite walls of the seminal sac, but, becoming more condensed at the base and apex of the cavity of the theca, it ascends in its axis and meets the descending portion in the hollow of the columella, over whose surfaces they both ramify; and 3rd, of a vertically elongated ring (the seminal sac) through whose centre this second membrane passes. Mr. Wilson (to whom I am indebted for my knowledge of the structure of both theca and cellular tissue of *Sphagnum*), has not been able, from the want of specimens, to confirm this view of the structure of *Voitia*; he, however, informs me, that "the existence of such a connecting tissue is only analogous to what is found in *Gymnostomum pyriforme*, whose sporular sac is connected with the base of the theca by a bundle of filaments;" he also adds, that "in many *Polytricha* there is a distinct, almost woody, central axis to the columella, with filaments intervening betwixt it and the winged folds of the sporular sac which forms the outer part of the columella."—J. D. H.

to take place through the decay of the theca, when, as frequently happens, the theca and seta are together detached from the plant, and possibly, if persistent, the operation may be aided by the development of a fungus which we have seen in the walls of the capsule of *V. hyperborea*.

The more complicated structure of these parts, which most peristomed mosses possess, may eventually prove mere modifications of, or deviations from the simpler organization of *Voitia* and *Sphagnum*. *Gymnostomum pyriforme* tends to confirm such a theory; in it the columella (what is considered as such being the inflected portion of the sac), ascends from the bottom of the theca to the level of the stoma, and then, expanding outwards, like the mouth of a funnel, reunites with the seminal sac around the rim of the stoma (vid. Grev. and Arn. l. c. vol. p. —). After a time, the edge of the funnel breaks away from that of the sac and with the columella shrivels up, thus giving egress to the sporules.

Mr. Valentine, in his 'Genera of Mosses,' has accurately described the cellular tissue of *Sphagnum*, which is, in several respects, exceedingly curious. The cells themselves are bounded by very thick lines, formed of slender tubes, running between the contiguous cells, but on one side of the leaf only; a transverse section of a small portion of a leaf, exhibiting both the cells and the interjected tubes, is shown at fig. 46. Valentine considers that the latter are derived from the elongated tubes of the stem.

The cells themselves are furnished, in some forms of the genus, with one or more spiral filaments, closely adhering to their walls, sometimes these are entire throughout the length of the cell, at others broken or both broken and branched. We are inclined to believe that the spiral filament is terete and adheres by a small portion only of its surface to the tissue of the leaf; the extreme minuteness and transparency of the parts, however, increase the difficulty of determining such a point with the accuracy that is desirable. No function has, hitherto, that we are aware of, been assigned to these filaments; they may act powerfully in enabling so delicate a tissue to withstand the pressure of the water.

The pores, by means of which a communication between the cavity of the cells and their surrounding medium is preserved, are, in most cases, numerous and large, in others less so; they appear more frequent on the upper surface of the leaf, but are by no means confined to it, for sometimes they are placed opposite to one another, when the leaf itself is perforated. They exist both in cells provided with spiral filaments and without; in some instances, where the spires are broken and branched, the pores are bordered with a thick ring given off from the filament, whence probably arises the supposition that what appeared to be pores were supplementary coils. They vary greatly in size, occasionally extending completely across the cell. Valentine describes them as resembling a minute truncated cone; to us they appear on the same plane with the walls of the cells, except where their edges are thickened, as described above. In *S. macrophyllum* the cells are devoid of any filaments, are very narrow, much elongated, and each perforated by from 8 to 14 large pores, which sometimes nearly divide the cell on one side; they are by far most numerous on the upper surface of the leaf. The uses of these pores are hitherto unknown, they may be due to the nature of the situations in which the species are found. We have not proved them to reside in the intercellular tubes, though their existence in their walls is possible also. On the other hand, the latter alone may continue reservoirs for water during dry seasons, when, from the porous nature of the former, they readily part with their moisture.

Until the dehiscence of the operculum, no rupture of the calyptra takes place in *Sphagnum*. We have not observed the desilient property of the operculum, noticed by some authors. The sporules in all the species are clustered together in fours, of which three only are generally visible at first sight, as represented at Fig. VI. In most of the species the surface of the theca is studded over with stomatiform pores; these are however very inconspicuous, if not wholly absent, in *S. cymbifolium*. The true pedicel is included within the vaginula and is singularly dilated below the orifice of the latter.

PLATE LVII. *Fig.* VI.—1, Longitudinal section of theca of *S. cymbifolium*; 2, section of cellular substance from centre of the same; 3, spores in a very young state; 4, cellular tissue of leaf showing spiral vessels and pores;

5, cell of *S. macrophyllum* with no spiral filament and many large pores; 6, transverse section of the cells of a leaf of *S. cymbifolium*:—all highly *magnified.*

1. Sphagnum *compactum*, Brid., caule erecto ramoso, ramis dense confertis, foliis imbricatis concavis ovato-oblongis obtusis apice denticulatis, theca ovato-rotundata, pseudopodio brevi. S. compactum, *Brid. Bryol. Univ.* vol. i. p. 16.

Var. β, *rigidum*; foliis subrigidis convolutis superne attenuatis apice patulis, pseudopodio gracili subelongato. *Nees et Hornsch. Bryol. Germ.* vol. i. p. 14. t. 2. f. 5*.

Var. γ, *ovatum*; foliis patentibus ovatis subacutis.

Hab. Campbell's Island; in bogs near the sea, both the varieties growing together.

The variety γ. *ovatum* may possibly be a distinct species, though we have not ventured to separate it specifically; it differs from the usual state of the plant in the ovate, not oblong, leaves, which are more acute at the apex, with somewhat cartilaginous margins. Dr. Lyall's specimens, though fragments, evidently belong to a much larger moss than *S. cymbifolium*, Dill., with more tumid branches. Of this species Bridel remarks, "a *S. cymbifolio*, foliis semper apice denticulatis, i.e. præmorsis, ut et toto habitu distinctissimum." The oblong leaves of var. β and the absence of the spiral fibres in the outer cells of the ramuli also appear constant peculiarities.

In this, as in some other species, it is not uncommon to observe the spiral fibres of the lower cells of the leaf disposed in a double or triple helix. The interposed circular discs are readily seen to be pores, from their strong similarity to the distinct apertures found on the cells of the ramulus. The outer cells of the branches seem analogous to the ordinary cellular tissue of the leaves, and the inner to their intercellular tubes; whence the true position of the latter on the upper surface of the leaf may be inferred: whilst, on the other hand, the concavity of the foliage would lead to the supposition of their occupying the opposite one.

3. LEPTOSTOMUM, *Br.*

Peristomium simplex e thecæ membrana interiore ortum, annulare, suberectum, indivisum v. rarius subdenticulatum. *Calyptra* glabra, dimidiata. *Theca* æqualis v. rarius gibbosa, oblonga, in apophysin spuriam obconicam attenuata.

1. Leptostomum *gracile*, Br.; caule cæspitoso subramoso, foliis oblongis subacutis piliferis inferioribus ovato-lanceolatis, theca pendula oblongo-cylindracea, operculo hemispherico. L. gracile, *Brown in Trans. Linn. Soc.* vol. x. p. 321. *Schwaeg. Suppl.* vol. ii. pt. 1. p. 12. t. 104. Gymnostomum gracile, *Hook. Musc. Exot.* t. 22.

Hab. Campbell's Island; on exposed rocks, altitude 1200 feet, barren.

It is not yet proved whether the *L. gracile* and *L. inclinans* be really distinct. Our specimens agree with the former, in having a strong excurrent nerve; they differ from it in the stems being densely matted with radicles, and from *L. inclinans* in the leaves not being contorted when dry and their margins not revolute. There is a new and very well marked species in the Hookerian Herbarium, *L. Bridgesii*, Wils., MS., from Conception and Colchagua in Chili, in which the leaves are piliferous, with the nerve evanescent below the apex, the seta short, and the theca, instead of being pyriform, is widest at the base.

4. SPLACHNUM, *L.*

Peristomium simplex. *Dentes* sedecim, per paria coadunati v. approximati, longitudinaliter exarati, tandem reflexi et plerumque thecæ extus appressi. *Calyptra* campanulata, basi subintegra v. fissa, theca brevior. *Theca* æqualis, apophysata, exannulata.

It is with much reluctance that we refuse to adopt the views of Bruch and Schimper, who, in their beautiful 'Bryologia Europæa,' subdivide *Splachnum* into three or four genera. The several characters which the two species here enumerated possess and which are not conformable with those of any of the subgenera alluded to, would, were these adopted, oblige us to construct a fifth for their reception. *S. octoblepharum* and *S. purpurascens* are so nearly allied to the *S. mnioides*, that we doubt the propriety of even retaining two genera which might be founded on the very dissimilar structure of the calyptra, but on that character alone, unaccompanied with any difference of habit. In one of Bruch and Schimper's divisions, *Tetraptodon*, the calyptra is truly dimidiate and neither inflexed nor appendiculate at the base; in the other, we always find it, previous to its separation from the vaginula, inflexed at the base, but when the seta elongates and carries up the calyptra, this inflexed portion is drawn out and remains as a lacerated and somewhat incurved membrane or appendage. A similar structure is observable in *Schlotheimia*, under which genus the development of *S. quadrifida* is illustrated.

In all the species which we have had an opportunity of examining in a recent state, and especially in *S. sphericum*, *ampullaceum* and *mnioides*, there is a very peculiar arrangement of the sporules, in lines radiating from the columella. Each of these lines is composed of eight or more sporules, contained either in separate cells or in membranous tubes, of a nature evidently analogous to the asci of some Fungi. This structure is probably common to all the species and may be traced obscurely in the dried state of some; it has, however, escaped the observation of Bruch and Schimper, who perhaps did not examine specimens in a sufficiently young state.

The southern species, those at least from the higher latitudes, inhabit decayed vegetable matter.

1. Splachnum *purpurascens*, Hook. fil. et Wils.; caule elongato, foliis patulis obovatis acuminatis integerrimis undulatis evanidinerviis apicibus recurvis, theca elliptico-oblonga microstoma, apophysi obconica angusta, operculo conico. (Tab. LVII. Fig. V. 1.)

Var. β, *minor*. (Tab. LVII. Fig. V. 8.)

Hab. Campbell's Island; in moist bogs, amongst grass; altitude 1000 feet.

Caules laxe cæspitosi, vix ramosi, semiuncíales et ultra. *Folia* patula, subremota, planiuscula v. undulata, siccitate crispa, laxe reticulata, inferiora luride purpurascentia. *Inflorescentia* monoica; flores masculi gemmaceo-capituliformes ad baseos foliorum sessiles v. in ramulis propriis terminales. *Seta* uncialis, valida, rubra, nitida, sensim in apophysin theca breviorem incrassata. *Peristomii dentes* octo, conniventes, luteoli, integri v. medio rima longitudinali ad apicem non producta fissi, siccitate fusci et reflexi. *Columella* apice dilatata, plerumque breviter exserta. *Operculum* parvum, anguste conicum, subrostellatum, rarius hemisphericum, flavescens v. rufo-brunneum. *Calyptra* non visa.

Nearly allied to *S. octoblepharum*, but larger, the leaves wider, more distant, less produced at the apex and more crisped when dry. Capsule narrow and more attenuated below, with a smaller mouth. In the var. β, both the two lateral of the longitudinal and the transverse lines on the teeth are very faint; in no instance do the teeth in this species appear to be really formed of four, the lateral lines always ceasing below the apex; the lower part of each double tooth is formed by four cells in a line, but their summits of only two.

Plate LVII. *Fig.* V.—1, *S. purpurascens*, of the *natural size*; 2, a leaf; 3 and 4, capsules; 5, teeth closely approximated in pairs; 6, the same, of var. β; 7, the same of var. *a*, with a longitudinal fissure and some sporules:—*magnified*. 8, a small tuft of var. β, of the *natural size*.

2. Splachnum *octoblepharum*, Hook.; subramosum, foliis obovatis longe acuminatis subpiliferis integerrimis, theca una cum apophysi clavata, peristomii dentibus octo solitariis. S. octoblepharum, *Hook. Musc. Exot.* t. 167. *Schwaeg. Suppl.* II. pt. 1. p. 105. t. 129. (omitted in *Bridel. Bryol. Univ.*)

Var. β, *pyriforme*; foliis magis erectis confertis, apophysi angustiore. (Tab. LVII. Fig. IV. 1.)

Var. γ, *major*; foliis majoribus latioribus luride viridibus, dentibus 8 geminatis. (Tab. LVII. Fig. IV. 6.)

Hab. Lord Auckland's group; vars. α and β, in spongy bogs and in holes of trees in the woods, frequent. Campbell's Island; var. α, not uncommon; and var. β, in the wet and wooded valleys, on the ground.

From its northern ally, *S. mnioides*, this species differs, both in the structure of the peristome and in the shorter calyptra, which is mitræform and inflexed at the base; also in the carinate leaves. The inflorescence appears truly monoicous, once only we found a hermaphrodite flower. In the varieties α and β, the theca varies greatly in form, and the columella is either included or exserted. In var. γ, the leaves are often very large, and the teeth connive so closely as to appear but 8, which are separable into 16; they are pale yellow, each with a faint middle line: when dry they are erect, recurved or reflexed, and generally of a purple brown colour.

Plate LVII. *Fig.* IV.—1, a small tuft of var. β, of the *natural size*; 2, a leaf; 3, a capsule; 4, teeth; 5, a calyptra;—*magnified*: 6, a plant of var. γ, of the *natural size*; 7, a leaf; 8, a capsule; and 9, teeth of the same:—*magnified.*

5. DRYPTODON, *Brid.*

Peristomium simplex. *Dentes* sedecim, inæqualiter bifidi, v. apice lacero-fissi. *Calyptra* mitræformis, basi lacera. *Theca* æqualis, annulata. Brid. *Bryol. Univ.*, vol. i. p. 191.

This genus is perhaps not distinct from *Grimmia.*

1. Dryptodon *crispulus*, Hook. fil. et Wils.; caule fastigiatim ramoso, foliis ovato-oblongis acuminatis v. e basi ovata gradatim subulato-acuminatis carinatis nervo percurrente, seta perbrevi, theca elliptica, operculo rostrato. (Tab. LVII. Fig. IX.)

Hab. Campbell's Island; on alpine rocks.

Caules laxe cæspitosi, superne fastigiatim ramosi, subrigidi. *Folia* erecto-patentia, subrecurva, margine basi reflexa, forma sat varia, superiora longiora, apice subdiaphana, vix pilifera, nervo valido continuo instructa, flavo-viridia, siccitate crispatula erecta; perichætialia breviora, elliptico-oblonga, obtusa v. acuta. *Seta* vix lineam longa, foliis immersa, pallida, tandem lateralis. *Theca* erecta v. inclinata, elliptico-oblonga, fusco-lutea. *Peristomii* dentes vix ad medium fissi, rufi, conniventes, siccitate reflexi. *Operculum* conico-rostratum, rectum, theca $\frac{2}{3}$ brevius. *Calyptra* conico-mitræformis, subplicata, costata, fusca, basi lacera et inflexa, operculo paulo longior. *Annulus* parvus.

The foliage of this moss bears a considerable resemblance to that of *Racomitrium fasciculare*, from which it differs in the very short seta, pale elliptical theca, and in the peristome being truly that of a *Dryptodon.*

Plate LVII. *Fig.* IX.—1, a specimen of the *natural size*; 2, a cauline leaf; 3 and 4, perichætial leaves; 5, theca; 6, operculum; 7, teeth; 8, calyptra:—*magnified.*

6. RACOMITRIUM, *Brid.*

Peristomium simplex. *Dentes* sedecim ad basin usque bi-tri-quadripartiti, cruribus filiformibus conjuncti. *Calyptra* mitræformis v. campanulata et subulata, theca brevior, basi lacera. *Theca* æqualis exannulata.

1. Racomitrium *lanuginosum*, Bridel, *Bryol. Univ.* vol. i. p. 215. Trichostomum, *Hedw. Musc. Frond.* vol. iii. p. 3. t. 2. *Hook. et Tayl. Musc. Brit.* p. 105. t. 19.

Hab. Campbell's Island; amongst tufts of grass at the foot of precipices, rare and barren.

This does not appear to differ from European specimens.

7. ORTHOTRICHUM, *Hedw.*

Peristomium simplex v. duplex, rarius nullum; *exterius* dentes triginta duo, geminatim v. bigeminatim coadunati, (hinc quasi octo v. sedecim apparent); *interius* ciliæ octo, æquales, v. sedecim, alternis brevioribus, erectis v. horizontaliter patentibus. *Calyptra* campanulata, costata, basi lacera v. crenata, plerumque pilosa. *Theca* erecta, æqualis, exannulata, tandem sulcata, in setam superne incrassatam gradatim attenuata.

1. ORTHOTRICHUM *crassifolium*, Hook. fil. et Wils.; caule brevi subramoso, foliis erecto-patentibus lanceolato-subulatis obtusis carnosis nervo crasso subcontinuo, theca breviter exserta pyriformi lævi, peristomii dentibus sedecim, ciliis nullis, calyptra glabra. (TAB. LVII. Fig. VIII.)

Var. β; foliis longioribus, theca breviore foliis immersa.

HAB. Lord Auckland's group and Campbell's Island; on rocks and stones immediately above high-water mark. Var. β, Campbell's Island, with the following species.

Caules pulvinati, 2–4 lin. longi. *Folia* suberecta, crassa, coriacea, supra plana, apice subobtusa, marginibus basi inflexis, nervo crasso infra apicem evanido, siccitate paulo incurva, olivacea v. fusco-lutea, demum nigricantia, suprema linearia, basi latiora. *Inflorescentia* dioica? *Fl. masc.* gemmiformis, terminalis. *Seta* sub lineam longa, valida; vaginula oblonga. *Theca* erecta, pyriformis, v. subturbinata, fusco-lutea, collo brevi, siccitate subcylindracea. *Peristomii dentes* liberi, siccitate erecti v. reflexi, lutei. *Sporæ* majusculæ, subrotundæ, rufo-olivaceæ. *Operculum* convexum, rostello recto, thecæ $\frac{1}{3}$ longitud. *Calyptra* plicata, glabra, rufo-brunnea, basi octofida.

Perhaps allied to the *O. psychrophilum*, Montagne (Ann. Sc. Nat., vol. ix. p. 52); but the leaves are more erect with their margins not reflexed, the capsule even, of a thicker texture, and there is no inner peristome. It bears some resemblance to the *O. Magellanicum*, Mont., from which the same characters will also distinguish it. The dry foliage is of an almost horny consistence.

PLATE LVII. *Fig.* VIII.—1, a specimen of the *natural size*; 2, a portion of stem and theca; 3 and 4, leaves; 5, transverse section of ditto; 6, teeth; 7, sporules; 8, calyptra:—*magnified.*

2. ORTHOTRICHUM *angustifolium*, Hook. fil. et Wils.; caule brevi subramoso, foliis erectis anguste lineari-subulatis acutiusculis carnosis nervo continuo, theca subsessili immersa elliptica, operculo rostellato, peristomii simplicis dentibus sedecim. (TAB. LVII. Fig. VII.)

HAB. Campbell's Island; on rocks at an elevation of 1200–1400 feet.

Caules pulvinati, 2–3 lin. longi, luridi, rigidi, ramis subterminalibus abbreviatis. *Folia* suberecta, conferta, elongata, stricta, opaca, subcarnosa, supra plana, nervo crasso continuo, siccitate subincurva, atro-viridia; *perichætialia* longiora, lanceolata, acuminata, superne attenuata, subsecunda. *Seta* brevissima. *Theca* elliptico-ovata, parva, pallide fusca, ore majusculo. *Dentes* conniventes, pallide ferruginei, siccitate reflexi. *Sporæ* majusculæ. *Operculum* basi convexum, rostello brevi recto. *Calyptra* non visa.

Allied to the former species, but with larger, much narrower and almost setaceous leaves; the capsule also is smaller and hidden amongst the foliage.

PLATE LVII. *Fig.* VII.—1, a tuft of the *natural size*; 2, branch; 3 and 4, leaves; 5, theca and seta:—*magnified.*

8. MACROMITRIUM, *Brid.*

Peristomium simplex v. duplex; *exterius* dentes sedecim, lanceolati, plus minusve geminatim connexi; *interius* membrana apice lacera, multifida. *Calyptra* conica, glabra v. pilosa, basi in lacinias plurimas æquilongas fissa. *Theca* æqualis, exannulata.

In an early state the difference between the calyptra of this genus and of *Orthotrichum* is very considerable, being, in the present case, linear and subulate; but in the latter genus campanulate. We consider Bridel's definition of this as drawn from more natural characters than that of Schwaegrichen.

1. MACROMITRIUM *longirostre*, Schwaegr.; caule repente, ramis erectis, foliis confertis erecto-patentibus lineari-lanceolatis lineis duabus notatis solidinerviis siccitate tortilibus, theca ovali sulcata, calyptra glabra. M. longirostre, *Schwaeg. Suppl.* vol. ii. pt. 2. p. 131. t. 112. *Brid. Bryol. Univ.* vol. i. p. 310. Orthotrichum, *Hook. Musc. Exot.* t. 25.

HAB. Lord Auckland's group and Campbell's Island; abundant on the trunks of trees near the sea.

This species varies considerably in colour and in habit; the leaves are, sometimes, narrower and more spreading than in these specimens; when dry they are always twisted round the stem.

2. MACROMITRIUM *acutifolium*, Brid.; caule repente ramosissimo, foliis lanceolatis valde acuminatis tortis nervo subexcurrente, theca ovata striata, operculi rostro aciculari, calyptra glabra. M. acutifolium, *Brid. Bryol. Univ.* vol. i. p. 736. Orthotrichum, *Hook. and Grev. in Edinb. Journ. of Science*, vol. i. p. 118. t. 5.

HAB. Lord Auckland's group; on rocks at the top of the hill above Rendezvous Harbour, barren and very scarce.

9. SCHLOTHEIMIA, *Brid.*

Peristomium duplex; *exterius* dentes sedecim, per paria approximati, siccitate spiraliter revoluti; *interius* membrana conica, in lacinias sedecim pluresve dentiformes inæqualiter fissa. *Calyptra* conico-mitræformis, glabra, basi appendiculata, demum lacera. *Theca* æqualis, exannulata.

Some species of *Macromitrium*, possessing a double peristome, have been confounded with this genus: from our own experience we are inclined to consider the appendiculate cylindrical calyptra as the most decisive character of *Schlotheimia*; the structure of the peristome apparently affording marks of minor importance only. In an early stage, a fold of the calyptra is produced downwards below the point of insertion of that organ into the vaginula, as in some *Splachna*, *Encalypta*, and possibly in other genera of Mosses. This inverted portion, after the lengthening of the seta has detached the calyptra, splits into four or more segments; vid. PLATE LVIII. *Fig.* I.—11 and 12.

1. SCHLOTHEIMIA *quadrifida*, Brid.; foliis oblongo-lanceolatis cuspidatis tortis, theca oblongo-pyriformi lævi, calyptra glabra. S. quadrifida, *Brid. Suppl. Musc.* vol. ii. p. 18. *Schwaeg. Suppl.* vol. i. pt. 2. p. 41. and vol. ii. pt. 2. p. 147. t. 57. *Brid. Bryol. Univ.* vol. i. p. 321. (TAB. LVIII. Fig. I.)

Var. β; caule robusto, foliis magis confertis inferioribus nigricantibus brevius cuspidatis.

HAB. Campbell's Island; on rocks and dead bushes, frequent. Var. β, on rocks at an elevation of 1200–1400 feet.

This species approaches the *S. Brownii*, Schwaeg. (Suppl. vol. ii. pt. 2. p. 52. t. 167), from which it differs in the shorter and less excurrent nerve, and from *S. nitida* in the leaves being straight and not recurved. The leaves of var. β are of a darker colour, more closely and regularly twisted round the stem, and do not readily recover in water.

It is singular to remark how far these tropical forms extend into the southern regions, whence we infer that an equable climate is the chief condition they require. In Tasmania, where the climate is more excessive than in New Zealand under the same parallel, the *Schlotheimiæ* and *Macromitria* are almost unknown, though in the latter loca-

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I.

S. quadrifida.

II.

W. crispula. *var.*

III.

W. contecta.

IV.

D. Menziesii

V.

D. setosum.

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ANTARCTIC EXPEDITION

lity, and indeed throughout the three islands of New Zealand, they abound. Wherever they grow they invariably affect shade and shelter. The European genus *Orthotrichum*, on the other hand, of which there are several Tasmanian examples, is very rare in New Zealand; and in Lord Auckland's group and Campbell's Island, as in the Falkland and other Antarctic Islands, the species court exposure, growing on black and exposed rocks, enduring the full power of such solar heat as those regions afford during the day, and of the frost, wind, and nocturnal radiation at other times. Under these circumstances, their foliage is of a peculiarly hard and almost horny consistence, especially when dry.

PLATE LVIII. *Fig.* I.—1 and 2, tufts of the natural size; 3, cauline leaf; 4, upper leaf from near the perichætium; 5, theca; 6, peristome; 7, a tooth; 8, calyptra; 9, calyptra, in a very young state, adherent with the vaginula, split open, exposing the enclosed seta, which is erroneously represented as bulbous; 10, the same, entire, surrounded by pistilla; 11 and 12, calyptra, showing the base inflexed and attached to the summit of the vaginula:—*magnified.*

10. WEISSIA, *Hedw.*

Peristomium simplex, dentibus sedecim, suberectis, angustis, imperforatis. *Calyptra* cuculliformis. *Theca* æqualis, exapophysata, annulata v. exannulata.

1. WEISSIA *crispula*, Ludw.; caule erecto diviso, foliis imbricatis secundis lanceolatis acuminatis canaliculatis siccitate crispulis, theca erecta oblonga, operculo oblique rostrato. W. crispula, *Hedw. Sp. Musc.* p. 68. t. 12. *Brid. Bryol. Univ.* vol. i. p. 346.

Var. β, *ambigua*; foliis brevioribus subsecundis siccitate vix crispatis, perichætialibus acuminatis nervo excurrente, seta breviore, dentibus interdum per paria approximatis. (TAB. LVIII. Fig. II.)

HAB. Campbell's Island; on exposed rocks from 600–1200 feet above the level of the sea, abundant.

After a very careful comparison of the Campbell's Island plant with specimens of *W. crispula* from Snowdon, we are at length satisfied of the specific identity of the two. It is still uncertain whether the *W. crispula* of Hooker and Taylor be the same as that of Hedwig. The characters of the latter and of *W. cirrata*, as given by Schwaegrichen (Supp. vol. i. pt. 1. p. 75.), differ very slightly. Of *W. cirrata* both Hedwig and Bridel remark, "folia marginibus reflexis aut inflexis," the former we find constantly to be the case, in which respect the plant differs essentially from *crispula*. It is more than probable that the Moss from Snowdon, figured by Dillenius (Hist. Musc. t. 47. f. 38.), and quoted by Bridel as a synonym of his *Dicranum interruptum*, is the *W. crispula* of Hooker and Taylor, which may well be considered by Bridel, a *Dicranum*, having the habit of that genus, and the peristome being unknown to him.

PLATE LVIII. *Fig.* II.—1, tuft of the *natural size*; 2, a branch and theca; 3. a leaf; 4, a theca; 5, teeth; 6, calyptra:—*magnified.*

2. WEISSIA *contecta*, Hook. fil. et Wils.; caule fastigiatim ramoso, foliis erectis strictis lanceolatis superne setaceis integerrimis solidinerviis, seta perbrevi, theca ovata, operculo rostrato. (TAB. LVIII. Fig. III.)

HAB. Campbell's Island; on alpine rocks.

Caules sesquiunciales, dense cæspitosi, subrigidi, fragiles. *Folia* conferta, erecta, vix secunda, 3 lin. longa, in apicem rigidum linearem e nervo crasso excurrente formatum producta, integerrima, canaliculata, marginibus basi inflexis, inferiora fusco-atra, superiora flavo-viridia; *perichætialia* majora, conformia. *Inflorescentia* monoica. *Fl. masc.* ad basin fœminei, gemmiformes; *antheridia* paraphysibus plurimis immixta. *Seta* vix lineam longa, crassiuscula, innovationibus mox lateralis. *Theca* badia, ore patente. *Annulus* o. *Dentes* pyramidati, incurvi, transverse sulcati, ferrugineo-lutei, integri v. apice fissi, siccitate reflexi. *Sporæ* minutæ. *Operculum* basi hemisphericum, rostro obliquo, capsula parum breviore. *Calyptra* coriacea, subulata, parva, fusca.

This agrees with no other species of the genus in habit. It is allied to *Dicranum filiforme*, Schwaeg., but has entire teeth. The calyptra and operculum we have only seen detached amongst the leaves. There is a very similar plant in the Hookerian Herbarium, received from Mr. Dickson; it has however a much longer seta, the perichætial leaves are smaller and shorter, the cauline subsecund, more crisped when dry, and furnished with a thinner nerve.

PLATE LVIII. *Fig.* III.—1, a specimen of the *natural size*; 2 and 3, leaves; 4, perichætial leaf, seta, theca, &c.; 5, teeth; 6, calyptra:—*magnified.*

11. SPRUCEA*, *Brid.*

Peristomium simplex. *Dentes* sedecim, bifidi. *Calyptra* ampla, glaberrima, latere fissa, basi integerrima.—Holomitrium, *Bridel. Endl. et Mart. fl. Bras.* p. 17.

The generic name was founded on a mistaken view of the nature of the calyptra, described by Bridel as "elongato-conica, basi coarctata latereque integerrima;" it is entire, in a very young state only, before the theca is developed. Hornschuch first modified the description of that organ, which is truly dimidiate in all the species, though not as the last named author describes it, "campanulata." Except in greater size, it does not differ from that of *Weissia*. The essential difference between a dimidiate and mitriform calyptra arises simply from the former being too narrow to contain the mature theca, whilst the other is of sufficient capacity for that purpose. In habit this genus appears to us far less intimately allied to *Racomitrium* than to *Didymodon*, with which it coincides in the dilated bases of the leaves; the chief peculiarities are the shorter teeth and longer operculum, characteristics which, if taken in conjunction with the large perichætial leaves, may serve to keep the present distinct.

1. SPRUCEA *perichætialis*, Brid.; caule erecto ramoso, foliis imbricatis erecto-patentibus lanceolatis acuminatis margine planis, nervo continuo, perichætialibus vaginantibus, theca oblonga, operculo aciculari. Holomitrium perichætiale, *Brid. Bryol. Univ.* vol. i. p. 227. Trichostomum, *Hook. Musc. Exot.* t. 73.

HAB. Campbell's Island; not uncommon on the stems of shrubs.

In this species the teeth are split near the summit only, perforated below, and of a similar structure with those of a *Dryptodon*, Brid.

12. DICRANUM, *Hedw.*

Peristomium simplex; dentibus sedecim, bifidis. *Calyptra* cuculliformis.

1. DICRANUM *Menziesii*, Tayl.; caule ascendente subramoso, foliis secundis setaceis basi lanceolatis subrigidis apice sub lente serrulatis siccitate strictis nervo latiusculo valido subexcurrente, seta brevi, theca elliptico-oblonga basi substrumosa semiimmersa, operculo longirostro. D. Menziesii, *Taylor in Phytologist*, vol. ii. p. 1094.

HAB. Lord Auckland's group; on trunks of trees sparingly, barren.

Caules semiunciales. *Folia* suberecta, conferta, 3–5 lin. longa, valde angusta, supra canaliculata, flavescentia, marginibus basi inflexis; *perichætialia* vaginantia $\frac{1}{2}$–$\frac{1}{3}$ breviora, basi dilatata. *Seta* 3 lin. longa, pallida, vix tortilis.

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* Though very averse to the system of changing names, we should not feel ourselves justified in allowing that of *Holomitrium*, founded, as the name is, upon incorrect characters drawn from imperfect specimens, to remain. In proposing that of *Sprucea* for this fine genus, we commemorate the services rendered to British Botany, and especially to Muscology, by our acute friend, Mr. Richard Spruce, of York.

Theca suberecta, curvata, brunnea, siccitate infra orem contracta, demum obscure striata. *Dentes* suberecti, incurvi, rubri. *Operculum* capsulam æquans, rostro gracili, curvato.

The above description has been drawn up from original specimens, gathered by Mr. Menzies (during Vancouver's Voyage) in Dusky Bay, New Zealand. This plant differs from *D. fasciatum*, Hedw. (Sp. Musc. p. 127. t. 28.), in the longer, more setaceous, nerved leaves, solitary seta, and oblong theca. Two closely allied forms occur in Herb. Hook., one having longer stems and more rigid, lurid green leaves, suddenly dilated at the base; the other with lax spreading foliage.

PLATE LVIII. *Fig.* IV.—1, plant of the *natural size*; 2, part of branch with theca; 3, leaf; 4, lower part of ditto; 5, theca:—*magnified.*

2. DICRANUM *pungens*, Hook. fil. et Wils.; caule elongato subramoso, foliis secundis patentibus linearilanceolatis attenuatis convolutis apice carinatis serrulatis tenuinerviis, perichætialibus elongatis convolutis, seta mediocri torta, theca inclinata oblonga curvula, operculo longirostro. (TAB. LIX. Fig. I.)

HAB. Lord Auckland's group and Campbell's Island; barren in the latter locality.

Caules 3–4-unciales, robusti, erecti v. curvati, parce ramosi. *Folia* 4–5 lin. longa, conferta, patentia, subrigida, inferiora subsquarrosa, superiora dense congesta, supra carinata, marginibus apices versus dorsoque serratis, plerumque arcte convolutis, nervo tenui, luteo-viridia, nitida, siccitate supra medium torta; *perichætialia* intima 8 lin. longa, enervia, convoluta, integerrima. *Setæ* interdum binæ, 8–9 lin. longæ, graciles, subflexuosæ, rubræ, siccitate tortæ. *Theca* parvula, elliptico-oblonga, subcurvata, basi vix strumosa, rufo-brunnea, siccitate infra orem contracta. *Dentes* pro genere parvi, conniventes, demum supra medium fissi, ferruginei. *Operculum* (delapsum) theca longius, curvirostrum. *Calyptra* straminea.

This very handsome species resembles the *D. Blumii*, Schwaeg. (Suppl., vol. ii. pt. 2. p. 116. t. 185), inaccurately described as nerveless, but differs essentially in the form of the theca. *D. Billardieri* has shorter and broader leaves, and larger thecæ. In *D. setosum*, nobis, a nearer ally, the leaves are more setaceous and fragile, the nerve broader, and occupying the whole breadth towards the apex, the capsule is longer and more curved, the peristome larger and of a red colour, and the seta not twisted when dry.

PLATE LIX. *Fig.* I—1, a specimen of the *natural size*; 2, front, and 3, back view of a leaf; 4, young theca; 5, mature ditto; 6, teeth:—*magnified.*

3. DICRANUM *Billardieri*, Schwaeg.; caule elongato dichotome ramoso, foliis subsecundis basi lanceolatis longe acuminatis denticulatis, theca strumosa, operculo longirostro. D. Billardieri, *Schwaeg. Suppl.* vol. ii. pt. 1. p. 70. t. 121.

Var. β, *duriusculum*; caule humili fastigiatim ramoso, foliis magis rigidis attenuatis, nervo latiore, seta longiore.

HAB. Lord Auckland's group; on the ground and dead trunks of trees in woods, both varieties.

The habit of the var. β, which also grows on the more exposed uplands, is rather peculiar; still we can find no specific distinction between them. The *D. Novæ Hollandiæ*, Hornsch., does not appear different from this species.

4. DICRANUM *setosum*, Hook. fil. et Wils.; caule fragili subramoso, foliis strictis fragilibus suberectis longissime lanceolato-setaceis apice serrulatis nervo latiusculo subexcurrente, seta longiuscula, theca oblonga curvata, operculo longirostro. (TAB. LVIII. Fig. V.)

Var. β, *attenuatum*; caule flexili elongato ramoso. (TAB. LVIII. Fig. V. 2.)

Hab. Lord Auckland's group and Campbell's Island; on the ground, at the roots of trees in the woods. Var. β, Campbell's Island.

Caules 1–2 unciales et ultra, densi, fragiles. *Folia* semiuncialia, nitida, flavida, solidinervia, nervo in aristam longam excurrente; *perichætialia* abbreviata, vaginantia, basi dilatata. *Seta* 1 unc. longa, crassiuscula, vix torta. *Theca* suberecta, arcuata, substrumosa. *Operculum* theca longius, rostro tenui curvato. *Calyptra* fusca, apice rubra.

We are not acquainted with any species with which the present could be confounded. *D. longisetum*, Hook., has the leaves of a similar form, but their nerve is very broad and indistinct, and the theca is erect. *D. capillaceum*, Brid. (Bryol. Univ., vol. ii. p. 460), differs in the striated capsule. The stems of the var. β are four inches long.

Plate LVIII. *Fig.* V.—1, a tuft, of the *natural size*; 2, a stem of var. β, of the *natural size*; 3 and 4, leaves; 5, theca and calyptra; 6, operculum:—*magnified.*

13. CAMPYLOPUS, *Brid.*

Peristomium simplex; dentibus sedecim, bifidis v. bipartitis, imperforatis, cruribus æqualibus. *Calyptra* conica, fissa, rarius integra, basi fimbriato-lacera v. subciliata. *Theca* æqualis, exannulata, exapophysata, nunc basi inæquali pseudo-apophysata.

1. Campylopus *introflexus*, Brid.; caule erecto ramoso, foliis imbricatis e basi lata lanceolatis acuminatis piliferis nervo lato excurrente, seta madore curvata, theca elliptica striata, operculo conico. C. introflexus, *Brid. Bryol. Univ.* vol. i. p. 472. Dicranum, *Hedw. Sp. Musc.* p. 147. t. 29. fig. 1–7.

Hab. Lord Auckland's group and Campbell's Island; growing both in moist and dry places on the hills.

This species is remarkable for the divergence of the filiform apices of its leaves and the broad nerve which is obscurely lamellated at the back, their margins also are so inflexed as to give them a subulate appearance. The numerous thecæ arise from aggregated perichætia and are quite buried and concealed amongst the foliage. New Holland specimens of this moss exist in the Hookerian Herbarium under the name of *D. pudicum*, Hornsch. *D. capitiflorum*, Pal. de Beauv., from Bourbon, has more strict leaves, more distinctly lamellated at the back.

2. Campylopus *flexuosus*, Brid.; caule erecto subramoso, foliis rigidiusculis concavis subulatis acuminatis nervo lato continuo, seta curvata, theca ovata striata, operculo recto cuspidato. C. flexuosus, *Brid. Bryol. Univ.* vol. ii. p. 469. Dicranum, *Hedw. Sp. Musc.* p. 146. t. 38. f. 1–6. *Hook. et Tayl. Musc. Brit.* p. 94. t. 16.

Hab. Campbell's Island; barren.

14. LOPHIODON*, *Hook. fil. et Wils.*

Peristomium simplex; dentibus sedecim, pyramidatis, per paria approximatis. *Calyptra* cuculliformis.

This genus corresponds with the *Cynodon* of Bridel, a preoccupied name. The present species does not accord with Schwaegrichen's definition of *Cynodontium*, and we are thus obliged to establish a genus for its reception.

1. Lophiodon *strictus*, Hook. fil. et Wils. (Tab. LIX. Fig. II.)

Var. β, foliis longioribus flavidis, theca majore.

* Nomen e λοφίον *parva crista* et ὀδοὺς *dens*.

BRANCH OF THE ASIATIC SOCIETY

I

Dicr: pungens.

II

Lophiodon strictus.

IV

Bart: robusta.

III.

Pol: Magellanicum.

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Hab. Lord Auckland's group and Campbell's Island; on moist rocks at an altitude of 1200 feet in the former locality, descending lower in the latter. Var. β, Lord Auckland's group, with the former.

Caules sesquiunciales, cæspitosi, fastigiatim ramosi, ramis gracilibus. *Folia* erecta, subsecunda, striata, siccitate appressa, subrigida, longe lineari-setacea, basi lanceolata, vaginantia, flavo-viridia, inferiora nigrescentia; nervo valido continuo, apicem versus obtusum denticulatum paulo dilatato; *perichætialia* majora, convoluta. *Inflorescentia* dioica; *Fl. masc.* terminalis, gemmiformis. *Seta* vix uncialis, pallida, subtorta. *Theca* erecta, ovata, cylindracea, basi rotunda, badia, lævis, nitida. *Peristomii dentes* breves, fere horizontales, madore conniventes, siccitate erecti, pallide ferruginei. *Annulus* majusculus. *Sporæ* majusculæ. *Operculum* conico-rostratum, erectum, theca paulo longior. *Calyptra* theca longior, scariosa, fusca, latere fissa.

The singular apex of the leaf distinguishes this species, even in a barren state, from *Weissia contecta*, or any similar moss.

Plate LIX. *Fig.* I.—1 and 2, specimens of the *natural size*; 3 and 4, leaves; 5 and 6, thecæ; 7, peristome; 8, teeth; 9, calyptra:—*magnified.*

15. CERATODON, *Brid.*

Peristomium simplex; dentibus basi liberis, bipartitis, cruribus trabeculisque horizontalibus connexis, superne solutis, flexuosis. *Calyptra* cuculliformis. *Theca* inæqualis, annulata, tandem profunde sulcata, substrumosa.—Ceratodon, *Brid. Bryol. Univ.*, vol. i. p. 480.

1. Ceratodon *purpureus*, Brid.; l. c. Didymodon purpureus, *Hook. et Tayl. Musc. Brit.* p. 113. t. 20. Dicranum, *Hedwig, Sp. Musc.* p, 136. t. 36.

Hab. Lord Auckland's group and Campbell's Island; on the ground, abundant.

16. POLYTRICHUM, *L.*

Peristomium simplex; dentibus 32–64, brevibus, inflexis, cartilagineis, apicibus membrana horizontali (epiphragma) connexis. *Theca* exannulata, ore epiphragmate (e columellæ apice dilatato) clausa. *Calyptra* cuculliformis, glabra, v. indusio villoso e pilis intertextis obtecto. *Theca* exannulata.—Psilopilum, Catharinea, Pogonatum et Polytrichum, *Bridel et auctorum.*

We would gladly avail ourselves of Bruch and Schimper's subdivisions of this genus, as proposed in the 'Bryologia Europæa,' did not the antarctic species prove them to be unnatural. Even the European species do not coincide with the views of those authors, for the *Pogonatum nanum*, Br. and S., has the inner membrane of the sporangium surrounding the columella perfectly cylindrical, and thus is at variance with their definition; and there is nothing essentially different between its structure and that of *Atrichum*, of the corresponding membrane in which no mention is made. This inner sporuliferous lining of the columella exists in all mosses, as well as in the *Atrichum undulatum*, Br. and S., and is the portion of the seminal sac, which, being inverted at the base, ascends the axis of the theca surrounding the columella; it forms the visible columella; the tissue itself, being often of extreme tenuity, is frequently overlooked and its continuity with the sporular membrane is not always evident. We have attempted to explain this structure at p. 120, under *Sphagnum*. That the characters derived from the calyptra are not of generic value is proved by that organ being exposed in *P. magellanicum* and *dendroides*, which have otherwise all the characters of *Pogonatum*. The origin of the villous hairs composing the outer calyptra of many species and their original attachment to the vaginula did not escape the notice of Ehrhart and Mohr and subsequently of Wahlenberg, although overlooked by Bruch and Schimper, whose analyses of the genera of mosses are unequalled in point of exe-

cution. The origin of these hairs in no way argues the absence of paraphyses, which those authors observe, and which are sufficiently perceptible though of only half the diameter of the hairs themselves, these are perfectly straight and inserted near the base of the vaginula.

1. POLYTRICHUM *magellanicum*, Hedw.; caule ramoso, foliis rigidis patentibus recurvis basi ovatis vaginantibus deinde subulatis serratis, theca inclinata v. horizontali oblonga semi-cylindracea supra plana, operculo conico-rostrato, calyptra glabra. P. magellanicum, *Hedw. Sp. Musc.*, p. 101. t. 20. f. 1, 2. Catharinea, *Brid. Bryol. Univ.* vol. ii. p. 106. (TAB. LIX. Fig. III.)

HAB. Lord Auckland's group; moist ground, amongst grass near the tops of the hills.

Theca junior erecta, matura inclinata, tandem horizontalis, basi subgibbosa, fusco-brunnea.

In the peculiar form of the capsule (ill represented in Hedwig's figure) and in general habit, this moss bears a strong similarity to *Dawsonia*; Menzies, who describes the theca as subcylindrical in the Linnæan Transactions (vol. iv. p. 71.), is the only observer who has remarked its peculiar structure. The naked calyptra allies this species to the *Catharineæ* of Bridel, whence some may include it under the division called *Pogonatum* by Bruch and Schimper; on the other hand, the absence of an apophysis will connect it with *Oligotrichum*. From *Polytrichum* of Bruch. and Schimper, it differs in wanting proper angles on the capsule, and from *Atrichum*, of the same authors, in having the inner or inverted portion of the sporular membrane surrounding the columella 4-winged.

This moss is found in as low a south latitude as Brazil, from whence we have seen specimens collected by Raddi and named *Catharinea pseudo-polytrichum*, and there are others in the Herbarium formed by Mr. Gardner. It varies in the length and somewhat in the disposition of the leaves, which are sometimes widely spreading and squarrose, but in the specimens now under consideration, they are shorter than in others from Cape Horn. The seta is also of variable length.

PLATE LIX. *Fig.* III.—1, a specimen of the *natural size*; 2 and 3, leaves; 4, young theca; 5, mature ditto; 6, teeth; 7, transverse section of theca; 8, calyptra:—*magnified.*

17. CONOSTOMUM, *Swartz.*

Peristomium simplex; dentibus sedecim, in conum persistentem conniventibus, apicibus subulatis. *Calyptra* brevissima, conico-subulata, stricta, latere fissa. *Theca* subinæqualis, exannulata.

1. CONOSTOMUM *australe*, Swartz; caule erecto valde ramoso, ramis fastigiatis obscure pentagonis, foliis densis arcte imbricatis lineari-lanceolatis acuminatis supremis longe piliferis, theca cernua subrotundata v. ovato-globosa. C. australe, *Swartz in Schrader, Neu Bot. Journ.* vol. i. pt. 3. p. 31. t. 6. *Schwaeg. Suppl.*, vol. i. pt. 1. p. 80. and pt. 2. p. 108. t. 130. *Brid. Bryol. Univ.* vol. i. p. 152.

HAB. Lord Auckland's group and Campbell's Island; on moist rocks, at a considerable elevation.

Conostomum has recently been united with *Bartramia*, by Bruch and Schimper. The genus is still an eminently natural one. It is not upon the most evident characters, such as the various species of *Polytrichum* present, however constant they may be, that natural genera can in many cases be founded.

18. BARTRAMIA, *Hedw.*

Peristomium duplex; *exterius* dentes sedecim, inflexi; *interius* membrana carinata, in lacinias sedecim integras bifidasve fissa, ciliis interjectis v. nullis. *Calyptra* cuculliformis. *Theca* globosa v. ovato-globosa rarius elongata, inæqualis; ore obliquo, exannulato.—Philonotis et Bartramia, *Brid. Bryol. Univ.* vol. ii. p. 15 et 32.

1. BARTRAMIA *patens*, Brid.; caule erecto subramoso, foliis patentibus rigidis linearibus acuminatis serrulatis basi dilatatis vaginantibus, theca obliqua, operculo convexo. B. patens, *Brid. Bryol. Univ.* vol. ii. p. 38. *Schwaeg. Suppl.* vol. i. pt. 2. p. 55. t. 62. B. squarrosa, *Turner in Koenig's Annals of Botany*, vol. i. p. 583. t. 2. f. 2.

HAB. Campbell's Island; on rocks, half way up the hills; barren.

Allied to *B. ithyphylla*, Brid.; but larger, with the leaves longer and more dilated at the base.

2. BARTRAMIA *robusta*, Hook. fil. et Wils.; caule erecto subramoso, foliis patentibus rigidis subulatis serrulatis basi quadratis vaginantibus nervo lato continuo, seta crassiuscula, theca erecta, operculo conico rostellato. (TAB. LIX. Fig. IV.)

HAB. Lord Auckland's group and Campbell's Island; in moist places, especially towards the tops of the hills; barren in the latter island.

Caules cæspitosi, pollicares, robusti, basi radiculis intertexis fuscis dense obtecti et connexi. *Folia* densa, rigida, subfragilia, nervo latissimo crasso superne supra paginam folii totam extenso, flavo-viridia, inferiora subrufescentia. *Inflorescentia* dioica; *Fl. masc.* terminalis; antheridiis plurimis oblongis, paraphysibus longioribus immixtis. *Seta* 8 lin. longa, valida, haud torta, rubra. *Theca* erecta, globosa, brunnea, siccitate sulcata. *Peristomium* non visum, an nullum? *Operculum* conico-rostellatum, luteum. *Calyptra* fusca.

A more robust species than the *B. patens*, with broader and more rigid leaves, their dilated bases truly quadrate. The capsule is perfectly erect and the operculum rostellate. It essentially differs from the former in the dioecious inflorescence. The thecæ are not in a fit state to show the peristome, if this moss really possesses one, of which we have some doubt. This is not distinguishable from the *B. potosica* of Montagne (Ann. Sc. Nat., 2nd Series, vol. ix. p. 56), judging only from the description of that author; but an examination of authentic specimens proves the two truly distinct, the latter being more closely allied to *B. patens*, though having shorter leaves with their bases not quadrate, but oblong or almost obovate.

PLATE LIX. *Fig.* IV.—1, plant of the *natural size*; 2 and 3, leaves; 4 and 5, theca; 6, old ditto; 7, calyptra: —*magnified.*

3. BARTRAMIA *pendula*, Hook.; caule subpinnatim ramoso fastigiato, foliis ovato-lanceolatis longe acuminatis-serrulatis striatis nervo continuo, theca pendula ovato-globosa subcylindracea sulcata, operculo planiusculo. B. pendula, *Hook. Musc. Exot.* t. 21. Philonotis pendula, *Brid. Bryol. Univ.* vol. ii. p. 27. Mnium pendulum, *Smith in Linn. Trans.* vol. vii. p. 262.

HAB. Campbell's Island; frequent in marshy places, always barren.

Variable in aspect and sometimes resembling *B. fontana.*

19. BRYUM, *Dill.*

Peristomium duplex; *exterius* dentes sedecim, æquidistantes, lanceolati, simplices; *interius* membrana tenera, sedecim carinata, in processus totidem dorso carinatos producta, ciliis aut nullis aut plurimis filiformibus interjectis, dentibus externis oppositis. *Calyptra* parvula, cuculliformis. *Theca* inclinata v. pendula, oblonga, pyriformis v. clavata, plerumque annulata, collo brevissimo v. elongato instructa. Caules *apices versus innovantes.*—Bryum, Webera, Pohlia, Cladodium, *et* Ptychostomum, *Bridel et auctorum.*

In the generic character, given above, we have closely followed that of Bruch and Schimper (Bryol. Europ.), though not satisfied of the propriety of excluding *Mnium.*

1. Bryum *nutans*, Schreb.; caule subramoso breviusculo v. elongato, foliis superioribus elongato-lanceolatis apice serratis inferioribus ovato-lanceolatis integerrimis, theca nutante v. pendula oblongo-pyriformi longitudine varia, operculo majusculo convexo papillato. B. nutans, *Schreber, Fl. Lips.* p. 81. *Hook. et Tayl. Musc. Brit.* p. 203. t. 29. *Bruch et Schimper, Bryol. Europ. Fasc.* 6–9, p. 34. t. 12.

Hab. Lord Auckland's group; on the hills, at an altitude of 1000 feet; rare, growing in a peaty soil.

The description given above is mainly taken from the 'Bryologia Europæa,' the authors of which add to the specific character "hermaphroditum, antheridiis per paria in foliorum summorum perichætialiumque axillis inque archegoniorum receptaculo." The Auckland Island specimens are immature and vary in size, but coincide well with others of British growth. This is a moss of a high arctic as well as antarctic latitude.

2. Bryum *Wahlenbergii*, Schwaeg.; caule simplici erecto v. ascendente, foliis apices versus serratis inferioribus remotis ovatis acuminatis, caulinis confertis lanceolatis costa evanida instructis, theca inclinata v. pendula brevi pyriformi, operculo convexo v. subconico mamillato, dentibus majusculis. B. Wahlenbergii, *Schwaeg. Suppl.* vol. i. pt. 2. p. 92. t. 70. *Bruch et Schimper, Bryol. Europ. Fasc.* 6–9, p. 44. t. 19.

Hab. Lord Auckland's group; barren. (*Dr. Lyall.*)

The inflorescence of this moss is diœcious.

3. Bryum *blandum*, Hook. fil. et Wils.; caule subsimplici, foliis imbricatis erecto-patentibus oblongis obtusis integerrimis concavis, nervo tenui subcontinuo, theca—? (Tab. LX. Fig. I.)

Hab. Campbell's Island; in boggy places, frequent, but barren.

Caules pollicares, cæspitosi, parce ramosi, flaccidi. *Folia* suberecta, laxe imbricata, valde concava, membranacea, pellucida, laxe reticulata, areolis rhomboideo-hexagonis, marginibus non reflexis, siccitate appressa, contracta, nitida, infima rubella v. rosea, superiora pallide viridia, nervo rubello sub apicem v. evanido. *Fructus* deest.

A very beautiful moss, remarkable for its brilliant reddish and very membranous foliage. Allied to *B. cellulare*, Hook. (in Schwaeg. Suppl., t. 214 *a*, idem ac *Pohlia turbinata*, Schwaeg., l. c. t. 194?); but the leaves are larger, much more concave and obtuse, and the stems longer.

Plate LX. *Fig.* I.—1, and 2, specimens of the *natural size*; 3, a portion of a branch and leaves; 4, leaf:—*magnified.*

4. Bryum *truncorum*, Brid.; caule erecto subsimplici, foliis marginatis obovatis serratis longe acuminatis supremis rosulatis, theca pendula elongata cylindracea, operculo brevi conico apice acuto. B. truncorum, *Brid. Bryol. Univ.* vol. i. p. 699.

Hab. Campbell's Island; in moist exposed places, barren.

These specimens seem to be of the same species as others gathered in New Zealand with capsules, and which agree well with Bridel's description of *B. truncorum*, a Bourbon plant, detected by Bory de St. Vincent. Our moss is closely allied to the *B. ramosum*, Hook. (Ic. Plant. t. 20. f. 2), and also to *B. patens*, Hook. and Wils. (Lond. Journ. of Bot., vol. iii. p. 155), from which latter, as also from *B. roseum*, it differs in the margined leaves and in the remarkably narrow elongated theca. It is perhaps the *B. leptothecium*, Tayl. MSS.

5. Bryum *annulatum*, Hook. fil. et Wils.; caule perbrevi, foliis patentibus subrigidis ovato-lanceolatis acutis integerrimis solidinerviis, theca pendula ovata, operculo conico, annulo latissimo. (Tab. LX. Fig. II.)

Hab. Campbell's Island; on the low grounds, scarce.

I.

Bryum blandum.

II.

B. annulatum.

III.

Hypn. elongatum.

IV

H. consimile.

V

H. acutifolium.

VI.

H. scabrifolium.

W.W.J.D.H., & W.F. del.t

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Caules cæspitosi, 2 lin. longi. *Folia* conferta, subconcava, nervo crasso continuo vix excurrente instructa, siccitate non crispata. *Seta* 3–4 lin. longa, apice arcuata. *Theca* subobovata. *Peristomii externi* dentes lutei, trabeculati, trabeculis remotis. *Annulus* magnus, insignis, longitudine $\frac{1}{3}$ peristomii exterioris.

We advance this species with much hesitation and after a very careful examination. It is most nearly allied to the *B. balanoides* (Tayl. MSS.), of which it may possibly be a variety, differing from that moss in the rigid and differently shaped leaves, in the large annulus and distant trabeculæ of the outer teeth. The capsule is not sufficiently mature to show the nature of the ciliæ of the inner peristome.

PLATE LX. *Fig.* II.—1, a specimen of the *natural size*; 2, 3, 4, and 5, leaves; 6. theca:—*magnified.*

20. FUNARIA, *Schreb.*

Peristomium duplex; *exterius* dentes sedecim, obliqui, apice cohærentes; *interius* cilia totidem membranacea, basi connata, v. membrana plana, in ciliis 16, dentibus oppositis, fissa. *Calyptra* cuculliformis, ventricosa, basi subtetragona. *Theca* inæqualis, pyriformis, cernua, sæpius annulata.

1. FUNARIA *hygrometrica*, Hedw.; caule brevissimo subsimplici, foliis appressis ovato-lanceolatis integerrimis nervo excurrente, seta arcuata madore torta, theca cernua pyriformi profunde sulcata, operculo planiusculo. F. hygrometrica, *Hedw. Sp. Musc.* p. 170, *et auctorum.*

HAB. Campbell's Island; frequent on the hills; not seen in Lord Auckland's group.

The absence of this moss, in the parts of Lord Auckland's group explored by the expedition, is very remarkable, considering its abundance in Campbell's Island, and is doubtless owing to the presence of carbonized matter over the surface of a great part of the latter island. In the Antarctic regions, as in Europe, the *Funariæ* invariably follow fires, and the confervoid filaments of its youngest state constitute the first appearance of vegetation on the burnt soil of the Falkland Islands.

§ PLEUROCARPI.

21. ANŒCTANGIUM, *Brid.*

Stoma nudum. *Calyptra* cuculliformis. *Theca* æqualis, exannulata. *Seta* lateralis.—Hedwigia, *Hook. Musc. Exot.*

1. ANŒCTANGIUM *Humboldti*, Brid.; caule erecto diviso pinnatim ramoso, ramis deflexis subrecurvis, foliis imbricatis obovatis concavis enerviis piliferis, theca subglobosa sulcata, operculo basi planiusculo oblique rostrato. A. Humboldti, *Brid. Bryol. Univ.* vol. ii. p. 165. Hedwigia, *Hook. Musc. Exot.* t. 137. *Schwaeg. Suppl.* vol. ii. pt. 1. p. 9. t. 103.

Var. β, *australe*; caule breviore, foliis acutis seta recta breviore terminatis marginibus non cartilagineis.

HAB. Lord Auckland's group and Campbell's Island; on moist rocks, at an elevation of 1400 feet in the former and 600 in the latter island.

The original specimen, figured in the 'Musci Exotici,' has the leaves terminated by a slender hair-like production of their own length, whilst others, gathered by Dr. Lyall at Rio, are muticous in that respect; those now before us are intermediate, and some others from Cape Horn more closely resemble the moss of the Andes.

22. LEUCODON, *Schwaeg.*

Peristomium simplex, membranaceum; dentibus sedecim, bipartitis. *Calyptra* cuculliformis.

1. Leucodon *Lagurus*, Hook.; caule ramoso tomentoso, foliis imbricatis ovatis concavis acuminatis piliferis seminerviis, theca erecta cylindracea, operculo acuminato. L. Lagurus, *Hook. Musc. Exot.* t. 126. *Schwaeg. Suppl.* vol. i. pt. 1. p. 121. t. 133.

Var. β, foliis majoribus ima basi binerviis.

Hab. Campbell's Island; on rocks, at an elevation of 1000 feet, barren.

In the original specimens the leaves are generally nerved half-way up; in the present they possess two very short nerves; but the variety is not otherwise distinguishable from the Antarctic American plant.

23. LESKIA, *Hedwig.*

Peristomium duplex; *exterius* dentes sedecim acuti; *interius* membrana in dentibus sedecim æquilongis fissa. *Calyptra* cuculliformis.

1. Leskia *concinna*, Hook.; caule erecto bipinnatim ramoso, foliis distichis oblongis acuminatis marginatis apice serratis evanidinerviis stipulis conformibus duplo brevioribus, theca suberecta oblonga, operculo subulato. L. concinna, *Hook. Musc. Exot.* t. 34. *Schwaeg. Suppl.* t. 269. Hypopterygium, *Bridel, Bryol. Univ.* vol. ii. p. 711.

Hab. Lord Auckland's group; shady rocks on the tops of the hills, altitude 1200–1400 feet.

This moss, which is furnished with accessory leaves (stipules) on the lower surface of the stem, belongs to the same group as *Hypnum laricinum*, Hook. (Musc. Exot. t. 35), and *L. rotulata*, Hedw., they should perhaps be separated from *Leskia* and from *Hookeria*, to which they are in some respects allied. Bridel's genus *Hypopterygium* is so constructed as not to admit of these, the fertile flowers being lateral and not covered by the stipules, and the calyptra truly dimidiate instead of mitriform. In *Pterigynandrum ciliatum*, Hedw., which has the habit of this group, the peristome is single.

2. Leskia *tamariscina*, Hedw.; caule flabellatim ramoso, ramis subdivisis, foliis distichis oblique lanceolatis serrulatis evanidinerviis, stipulis rotundatis mucronatis, theca oblonga subpendula, operculo conico rostellato. L. tamariscina, *Hedw. Sp. Musc.* p. 212. t. 51. (*excl. syn. Swartzii fid. Hook.*). Hypopterygium, *Brid. Bryol. Univ.* vol. ii. p. 715.

Hab. Lord Auckland's group; barren. (*Dr. Lyall.*)

According to the remark in Hooker's Musc. Exot. (sub. t. 35), the name *Leskia tamariscina* of Swartz (Fl. Ind. Occ.), should be substituted for that of *L. rotulata*, Hedw. We are not aware that any subsequent author has noticed the curious tubular setiform processes in the axillæ of the leaves and sometimes of the stipules in this moss.

3. Leskia *Novæ-Hollandiæ*, Schwaeg.; caule erecto simplici, foliis distichis oblongo-lanceolatis apice denticulatis nervo in cuspidem excurrente, seta basilari elongata, theca ascendente cylindracea. L. Novæ Hollandiæ, *Schwaeg. Suppl.* vol. i. pt. 2. p. 160. t. 83. Rhizogonium, *Brid. Bryol. Univ.* vol. 2. p. 664.

Hab. Lord Auckland's group; on the trunks of trees in the deepest and darkest recesses of the woods; scarce and barren.

24. HYPNUM, *Dill.*

Peristomium duplex; *exterius* dentes sedecim, lanceolati, reflexiles; *interius* membrana carinata, in cilia totidem interdum pertusa ciliolis interjectis fissa. *Calyptra* cuculliformis.—Isothecium, Hypnum *et* Stereodon, *Bridel.*

Foliis distichis.

1. HYPNUM *bifarium*, Hook.; caule erecto subpinnatim ramoso, foliis remotis erecto-patentibus distichis lanceolatis marginatis duplicato-serratis solidinerviis, theca horizontali ovata, operculo conico acuminato. H. bifarium, *Hook. Musc. Exot.* t. 57. *Schwaeg. Suppl.* t. 257, *a*. Isothecium, *Brid. Bryol. Univ.* vol. ii. p. 356.

HAB. Lord Auckland's group; on the dead trunks of trees.

The serratures of the leaves are composed of a double row of spines, as in *H. spiniforme*. The operculum is half the length of the theca, shorter and less acuminated than in the figure in 'Musci Exotici.'

b. *Foliis imbricatis.*

* *Foliis solidinerviis.**

2. HYPNUM *spiniforme*, L.; caule erecto subsimplici, foliis patentibus lineari-subulatis marginatis duplicato- spinuloso-serratis solidinerviis, seta subbasilari, theca ovata arcuata, operculo oblique conico rostrato. H. spiniforme, *Linn. Sp. Pl.* p. 1587. *Hedwig, Musc.* vol. iii. p. 59. t. 25. *Brid. Bryol. Univ.* vol. ii. p. 557.

Var. *β*, caule gracili, foliis brevioribus lanceolato-subulatis luridis.

HAB. Lord Auckland's group; var. *β*, under large tussacks of grass on the hills, rare and barren.

Neither in this nor in any other specimens of *H. spiniforme* have we seen the leaves to be bifarious.

3. HYPNUM *elongatum*, Hook. fil. et Wils.; caule elongato robusto subramoso, ramis elongatis, foliis erecto-patentibus ovato-lanceolatis nervo excurrente apiculatis serrulatis striatis. (TAB. LX. Fig. III.)

HAB. Lord Auckland's group and Campbell's Island; in dry rocky places on the hills, rare and always barren.

Caules 4–6 unciales, basi procumbentes, deinde ascendentes, incurvi, parce et vage ramosi. *Folia* suberecta, dense imbricata, serrulata, plicato-striata, siccitate erecta, subtorta, nervo tenui in apiculum exsertum subelongatum desinente instructa, flavo-viridia, nitida, inferiora sordide viridia, dorso papillosa, areolis minutis oblongis, basi marginibusque pellucidis reticulatis.

This moss closely resembles the *H. densum*†, Swartz (Fl. Ind. Occ.), which is but ill represented in Hedwig's 'Species Muscorum.'

PLATE LX. *Fig.* III.—1, a specimen, of the *natural size*; 2, leaf:—*magnified.*

4. HYPNUM *consimile*, Hook. fil. et Wils.; caule elongato subramoso debili, foliis erecto-patentibus supremis secundis ovato-lanceolatis acuminatis serrulatis striatis nervo subexcurrente. (TAB. LX. Fig. IV.)

HAB. Lord Auckland's group; in marshy places on the hills, barren.

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* The subdivisions here proposed appear to us more natural than those in general use, of which they are in some respects modifications.

† An original specimen of this in Herb. Hook. may be thus characterized;

H. *densum*, Sw.; foliis lanceolatis acuminatis argute serratis fragilibus siccitate striatis evanidinerviis (areolis rotundatis) margine basi punctatis. H. densum, *Swartz, Fl. Ind. Occ.*, p. 1829.

HAB. Jamaica; roots of trees on the Blue Mountains, (*Swartz*).

Caules 3–4 unciales, graciles, laxe cæspitosi, parce ramosi; ramis erectis. *Folia* laxe imbricata ut in *H. elongato*, sed multo minora et e basi subquadrata gradatim attenuata, minute serrulata, nervo valido apice incrassato subexcurrente instructa, areolis minimis subrotundis v. punctiformibus.

This moss might readily be taken for a slender state of the *H. elongatum*, nobis, from which it is truly distinct in the lower part of the leaf being subquadrate, angled on each side a little above the base, thence tapering gradually to a point, in the margin being more minutely serrated, the nerve stronger, and in the smaller reticulation.

PLATE LX. *Fig.* IV.—1, a specimen of the *natural size*; 2 and 3, leaves; 4, portion of a leaf, shewing the reticulation:—*magnified.*

5. HYPNUM *scabrifolium*, Hook. fil. et Wils.; caule pinnatim ramoso, foliis laxe imbricatis ovato-lanceolatis acuminatis margine scabris dorso papillosis nervo valido subexcurrente. (TAB. LX. Fig. VI.)

HAB. Lord Auckland's group; barren. (*Dr. Lyall.*)

Caules unciales et ultra, ramis interdum divisis. *Folia* caulina dissita, patentia, subrecurva; ramulina minora, laxe imbricata, erecto-patentia, vix secunda, siccitate incurva, nervo continuo, omnia margine scabra subdenticulata, glaucescentia, areolis minimis punctiformibus opacis.

This is one of the discoveries of my zealous friend Dr. Lyall, the value of whose collection is particularly noticed in the preface to this work. The number of mosses and sea-weeds especially, brought home from the Antarctic regions, was much increased through that officer's unwearied exertions.

Nearly allied to the *H. crispifolium*, Hook. (Musc. Exot. t. 31), but smaller, with the leaves neither plicate nor falcate.

PLATE LX. *Fig.* VI.—1, a specimen of the *natural size*; 2, a branch; 3 and 4, leaves; 5, apex of ditto:—*magnified.*

** *Foliis ruptinerviis.*

6. HYPNUM *rutabulum*, L.; caule procumbente vage ramoso, ramis subcompressis, foliis patentibus laxe imbricatis ovatis acuminatis subserrulatis nervo ad medium evanido, seta scabra, theca cernua ovata, operculo conico. H. rutabulum, *Linn. Sp. Pl.* p. 1590. *Hedw. Musc. Frond.* vol. iv. p. 29. t. 12. *Hook. et Tayl. Musc. Brit.* p. 176. t. 26.

HAB. Lord Auckland's group and Campbell's Island; in marshy situations.

There are two varieties in the collection, both of them barren.

7. HYPNUM *serpens*, L.; caule subpinnatim ramoso, ramulis simpliciusculis filiformibus suberectis, foliis patentibus ovatis acuminatis evanidinerviis, theca cernua oblonga, operculo convexo subconico acuto. H. serpens, *Linn. Sp. Pl.* p. 1596. *Hedwig, Musc. Frond.* vol. iv. p. 45. t. 18. *Hook. et Tayl. Musc. Brit.* p. 155. t. 24.

Var. β; foliis subsolidinerviis.

HAB. Lord Auckland's group; the var. β only. (*Dr. Lyall.*)

Except in the more defined nerve, this does not materially differ from British specimens.

*** *Foliis subenerviis.*

8. HYPNUM *acutifolium*, Hook. fil. et Wils.; caule fastigiatim ramoso, foliis dense imbricatis suberectis elliptico-lanceolatis acuminatis integerrimis enerviis. (TAB. LX. Fig. V.)

HAB. Campbell's Island.

Caulis procumbens, uncialis. *Rami* conferti, fastigiati, subsimplices, graciles, fragiles. *Folia* subsecunda, sicitate erecta, subappressa, vix pilifera, concava, luride viridia, areolis linearibus.

Allied to *H. extenuatum*, Brid., but smaller, the leaves more erect, and tapering gradually to a very narrow point.

PLATE LX. *Fig.* V.—1, a specimen, of the *natural size*; 2, portion of branch and leaves; 3, leaf:—*magnified.*

9. HYPNUM *chlamydophyllum*, Hook. fil. et Wils.; caule prostrato subramoso, ramis simplicibus elongatis cuspidatis, foliis imbricatis patentibus quadrato-rotundatis integerrimis basi truncatis concavis nervo breviusculo evanido, seta elongata gracili lævi, theca cernua ovato-oblonga, operculo conico. (TAB. LXI. Fig. I.)

HAB. Campbell's Island; on the ground, barren.

Caules sesquiunciales, vage ramosi; ramis 1 unc. longis, ad apices e foliis arcte convolutis cuspidatis. *Folia* valde concava, ad apices rotundata, obtusissima, basi latissima, truncata, subauriculata, pallide luteo-viridia, subscariosa, pellucida, splendentia, nervo simplici infra medium evanido v. nervis duobus brevibus, areolis anguste oblongis inferioribus multo majoribus; *perichætialia* erecta. *Seta* fere $1\frac{1}{2}$ unc. longa, gracilis, lævis, torta, rubra. *Theca* cernua v. horizontalis, ovato-oblonga, brunnea. *Peristomium* luteum. *Operculum* breve, theca concolor.

Allied to *H. cochlearifolium*, but with the habit of a *Leskia*, and readily distinguished by its cuspidate branches, wider and more flaccid leaves which are singularly broad and truncate at the base, where also there are a number of large pellucid cells; the seta also is longer and more slender.

The above description has been drawn up in part from fertile Tasmanian specimens, gathered in that country by Mr. Lawrence. There are in the Hookerian Herbarium several allied undescribed species, both from New Zealand and Tasmania. A Fuegian moss, *Hypnum? auriculatum*, Mont., (Voy. au Pole Sud, Bot. Cryptog., t. 20. fig. 3), is the American representative of this, it differs in having the base of the leaves produced on each side into two lobes.

PLATE LXI. *Fig.* I.—1, a specimen, of the *natural size*; 2, 3, and 4, leaves; 5 and 6, thecæ:—*magnified.*

10. HYPNUM *cochlearifolium*, Schwaeg.; caule subrepente, ramis ascendentibus apice radicantibus, foliis imbricatis subrotundis obtusiusculis concavissimis subhemisphericis enerviis, theca cernua ovata, operculo conico. H. flexile*, *Hook. Musc. Exot.* t. 110. (*excl. syn. Swartzii, Hedwigii*, et *Schwaegr.*)

HAB. Lord Auckland's group and Campbell's Island; at the foot of precipices near the tops of the mountains, altitude 1200–1400 feet; barren.

This moss is a native of the woods of New Zealand, even as far north as lat. 36° S.; hence its occurrence only at the tops of mountains in the most bleak and exposed situations of so high a latitude as Campbell's Island was quite unexpected. We cannot distinguish it from more luxuriant northern specimens in its barren state.

11. HYPNUM *Arbuscula*, Sw.; caule erecto bipinnatim ramoso, foliis imbricatis erecto-patentibus ovatis

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* The *Hypnum flexile*, Hedw., is a very different moss from this, as may be inferred from the following description drawn up from an authentic specimen:—

LESKIA *flexilis*, Hedw.; caule pendulo subpinnatim ramoso, foliis ovato-oblongis rigidiusculis apiculatis (apiculo recurvo) enerviis, perichætialibus squarrosis, theca erecta elliptica, operculo subulato, calyptra valde pilosa.—L. flexilis, *Hedw. Sp. Musc.* p. 234. t. 58. Hypnum? *Swartz, Prodr.* p. 141. *Fl. Ind. Occ.* p. 1830.

HAB. Jamaica; on the tops of mountains in the southern parts of the island, (*Swartz*).

obtusis integerrimis concavis subbinerviis, seta brevi, theca erecta ovata. H. Arbuscula, *Smith, in Linn. Trans.*, vol. xix. p. 280. t. 23. *Hook. Musc. Exot.* t. 112. Isothecium, *Brid. Bryol. Univ.* vol. ii. p. 372.

Var. β, foliis subdistichis. H. Arbuscula, *Schwaeg. Suppl.* t. 300.

Hab. Lord Auckland's group and Campbell's Island; rocky places on the hills; and on the ground in the woods, where it was found in fruit by Dr. Lyall. Var. β, Lord Auckland's Island; barren. (*Dr. Lyall.*)

The original specimens, figured in the 'Musci Exotici,' are there correctly described as having the leaves imbricated all round the stem, but the seta is represented too long and slender. The stems of the var. β are somewhat compressed, and the leaves thus become in a measure distichous, as shown in Schwaegrichen's figure, which may indicate a different species. The majority of our specimens agree well with the figure in 'Musc. Exot.;' except that the theca is more truly elliptical and somewhat apophysate, gradually tapering downwards into a thick slightly curved seta, which is very little longer than the capsule and barely exserted beyond the perichætial leaves. We have never seen the seta so short, or the theca so globose, as they are represented by Schwaegrichen. The arcuate stems sometimes root at the apex.

c. *Foliis patulis squarrosis.*

12. Hypnum *aciculare*, Brid.; caule vage ramoso, ramis simplicibus, foliis squarrosis ovatis acuminatis apice inciso-serratis subenerviis, theca inclinata cylindracea arcuata, operculo aciculari longissimo. H. aciculare, *Brid. Bryol. Univ.* vol. ii. p. 505. *Schwaeg. Suppl.* vol. ii. p. 280. t. 92.

Hab. Lord Auckland's group and Campbell's Island; on the ground in the woods, rare in fruit.

The calyptra is remarkably long in this moss, lanceolato-subulate, slightly inflated when young, of a rich chestnut-brown colour.

d. *Foliis secundis.*

* *Nervosis.*

13. Hypnum *comosum*, Lab.; caule repente, ramis erectis superne fastigiatim ramosis subdendroideis, foliis imbricatis subscopariis patentibus ovato-lanceolatis apice serratis nervo excurrente superioribus subsecundis, theca pendula sulcata, operculo curvirostro. H. comosum, *La Billard. Fl. Nov. Holl.* vol. ii. p. 107. t. 253. f. 2. *Schwaeg. Suppl.* vol. i. pt. 2. p. 265. t. 91. Isothecium, *Brid. Bryol. Univ.* vol. ii. p. 374.

Hab. Lord Auckland's group; forming large tufts in the woods near the sea, rarely fruiting.

In habit this fine moss resembles some species of *Bartramia*.

14. Hypnum *hispidum*, Hook. fil. et Wils.; caule ramoso curvato v. arcuato, foliis imbricatis falcato-secundis ovatis longe acuminatis integerrimis subplicatis nervo crasso longe exserto, seta lævi, theca ovata æquali, operculo longirostro. (Tab. LXI. Fig. II.)

Hab. Lord Auckland's group; rocky places near the tops of the hills, barren.

Caules 2–4 unciales, vage ramosi, ramis rigidis simpliciusculis, curvatis. *Folia* dense imbricata, rigida, basi ovata, deinde setaceo-subulata, nervo valido excurrente longe acuminata, subconcava, basi obscure plicata, atro-viridia, siccitate suberecta, areolis minutis; *perichætialia* minora, ovata, nervo longe exserto. *Seta* valida, flexuosa, ½ unc. longa, rigida, rubra, apice arcuata. *Theca* æqualis, subhorizontalis, fusco-lutea, operculo æquilongo, rostro obliquo. *Calyptra* non visa.

This is a very common moss in the northern island of New Zealand, growing on rocks, on the exposed roots of large forest-trees, especially of the *Podocarpus dacrydioides*, and upon stones in streams of water; under the last circum-

I

H. chlamydophyllum.

II

H. hispidum.

III

H. gracile.

IV

H. Terræ-novæ.

V

Hookeria nervosa.

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stances the stems become much elongated, and the whole plant resembles the *Anœctangium aquaticum*, Hedw. The drawing is made from New Zealand specimens.

PLATE LXI. *Fig.* II.—1, a specimen of the *natural size*; 2, another, of the aquatic state, also of the *natural size*; 3 and 4, leaves; 5, young theca; 6 and 7, mature thecæ:—*magnified*.

15. HYPNUM *filicinum*, L.; caule compresso pinnatim ramoso, foliis falcato-secundis lanceolatis acuminatis basi cordatis solidinerviis perichætialibus striatis, theca cernua subcylindracea, operculo conico acuto. H. filicinum, *Linn. Sp. Pl.* p. 1590. *Hedw. Sp. Musc.* p. 258. t. 76. f. 7–10. *Hook. et Tayl. Musc. Brit.* p. 183. t. 26.

Var. β, *minor*; caule gracili, foliis suberectis lanceolatis.

HAB. Var. β. Lord Auckland's group; in woods by the banks of streams. (*Dr. Lyall.*)

Though the habit is more delicate than that of British specimens, we are unable to separate this moss specifically from *H. filicinum*, of which a perfectly intermediate variety occurs in the Falkland Islands.

16. HYPNUM *fluitans*, L.; caule erecto v. natante subpinnatim ramoso, foliis laxe imbricatis falcatis lanceolatis acuminatis nervo ultra medium producto, theca cernua oblonga, operculo conico. H. fluitans, *Linn. Fl. Suec.* Ed. 2. p. 399. *Hedw. Musc. Frond.* vol. iv. p. 94. t. 36. *Hook. Musc. Brit.* p. 185. t. 24.

HAB. Campbell's Island; in swampy places, barren.

** *Foliis enerviis.*

17. HYPNUM *gracile*, Hook. fil. et Wils.; caule ramoso, ramis gracilibus subrecurvis, foliis imbricatis secundis erecto-patentibus ellipticis obtusiusculis concavis subdenticulatis subenerviis, perichætialibus squarrosis. (TAB. LXI. Fig. III.)

HAB. Lord Auckland's group; dry rocky places near the tops of the hills, scarce and barren.

Caules unciales et ultra, curvati, subsimplices, nunc valde ramosi; ramis gracilibus. *Folia* elliptica, subspathulata, minutissime denticulata, nervo infra medium evanido v. nervis duobus brevibus, areolis linearibus supremis latioribus; *perichætialia* ovata, acuminata, serrulata, enervia.

Allied to *H. micans*, Wils. (in Hook. Brit. Fl. vol. ii. p. 86), but different in the branched stems and larger leaves, which are not recurved at the margin.

PLATE LXI. *Fig.* III.—1, a specimen of the *natural size*; 2, a portion of a branch; 3 and 4, leaves:—*magnified*.

18. HYPNUM *cupressiforme*, L.; caule decumbente vage pinnatim ramoso, ramis simplicibus incurvis, foliis circinnato-falcatis secundis ovato-lanceolatis integerrimis subenerviis, perichætialibus conformibus, theca subcernua cylindracea, operculo conico cuspidato. H. cupressiforme, *Linn. Sp. Pl.* p. 1592. *Hedw. Musc. Frond.* vol. iv. p. 59. t. 23. *Hook. et Tayl. Musc. Brit.* p. 189. t. 27.

HAB. Lord Auckland's group and Campbell's Island; abundant, but barren.

19. HYPNUM *leptorhynchum*, Brid.; caule subpinnatim diviso, foliis falcatis tortis lineari-lanceolatis acuminatis apice denticulatis enerviis, theca nutante oblonga, operculo longissime et tenuissime rostrato. H. (Stereodon) leptorhynchum, *Brid. Bryol. Univ.* vol. ii. p. 621. *Schwaeg. Suppl.* vol. i. pt. 2. p. 295. t. 93.

Var. β, seta brevior.

HAB. Lord Auckland's group; both varieties on the trunks of prostrate trees, rare.

20. Hypnum *Terræ-Novæ*, Brid.; caule pinnatim ramoso, ramis incurvis simplicibus, foliis secundis circinnatim falcatis ovato-lanceolatis subintegris enerviis, perichætialibus elongatis recurvis subcrinitis subserrulatis, theca suberecta cylindracea, operculo brevi conico apiculato. H. Terræ-Novæ, *Brid. Bryol. Univ.* vol. ii. p. 619. (Tab. LXI. Fig. IV.)

Var. β, *australe*; foliis e basi lata gradatim attenuatis subpiliferis integerrimis.

Hab. Var. β. Campbell's Island; on decayed vegetable matter in the woods.

Our specimens do not sufficiently depart from the description of Bridel to warrant our considering them as a distinct species; the only difference appears to lie in the entire perichætial leaves and the cauline being probably more gradually attenuated from the base upwards. The seta is half an inch long. Operculum convex, subconical, or nearly hemispherical.

Plate LXI. *Fig.* IV.—1, a specimen of the *natural size*; 2, 3, and 4, leaves; 5 and 6, thecæ:—*magnified.*

25. HOOKERIA, *Sw.*

Peristomium duplex; *exterius* dentes sedecim, basi liberis; *interius* membrana erecta, in lacinias sedecim carinatas fissa, ciliolis interjectis plerumque nullis. *Calyptra* mitræformis.

1. *Foliis marginatis undique imbricatis.*

1. Hookeria *nervosa*, Hook. fil. et Wils.; caule parce fastigiatim ramoso, foliis imbricatis erecto-patentibus ovato-lanceolatis acuminatis carinatis marginatis integerrimis solidinerviis, theca erecta ovato-cylindracea apophysata, calyptra basi fimbriata. (Tab. LXI. Fig. V.)

Hab. Lord Auckland's group; on twigs of bushes in ravines, at an altitude of 500 feet, rare.

Caules fere 1½ unciales, dense conferti, ramis fastigiatis. *Folia* arcte imbricata, acuminata v. longe cuspidata, margine incrassata, nervo valido subexcurrente, pallide viridia, siccitate appressa, areolis rotundatis; *perichætialia* breviora, erecta, elliptica, obtusiuscula. *Seta* 3–4 lin. longa, rubra, apice scabriuscula. *Theca* parvula, suberecta. *Calyptra* conico-subulata, basi fimbriata, apice scabriuscula, fusco-brunnea.

This moss closely resembles the *Daltonia splachnoides*, Schwaeg., and cannot be generically removed from that plant. It differs specifically in the inflorescence not being hermaphrodite, in the shorter peristome, in the sporules being twice the diameter, the calyptra twice as long, less conical, the seta shorter and thicker, the theca more oblong; the leaves wider, more patent, carinate, and nerved to the very apex or beyond it. We have South American specimens of *D. splachnoides*; but none corresponding with the moss now before us.

Plate LXI. *Fig.* V.—1 and 2, specimens of the *natural size*; 3, a leaf; 4 and 5, perichætial leaves; 6, theca; 7, operculum; 8, teeth; 9, calyptra; 10, base of ditto:—*magnified.*

2. Hookeria *pulchella*, Hook. fil. et Wils.; caule procumbente distiche ramoso, ramis compressis, foliis confertis imbricatis subdistichis obovatis obtusis marginatis seminerviis, theca suberecta oblonga apophysata, operculo rostrato, calyptra basi dense fimbriata superne glabra. (Tab. LXII. Fig. I.)

Hab. Lord Auckland's group; on bushes and the ultimate branches of trees, about 500 feet above the sea, rare, but abundantly fruiting.

Caules semiunciales et ultra, subpinnatim ramosi; ramis subcomplanatis mollibus. *Folia* late obovata obtusa interdum apiculata, flaccida, pellucida, lateralia patentia, antica posticaque subappressa, margine tenue cartilaginea, albida, integerrima, nervo tenui ad medium evanido instructa, areolis parvis rotundatis inferioribus majoribus; *perichætialia* minora, erecta, ovata, obtusa, subconvoluta. *Seta* vix semiuncialis, apice scabriuscula, luride rubra, infra

I.

Hook: pulchella.

II.

H. denticulata.

III.

H. pennata. *var.*

IV.

Jung. stygia.

V.

J. acinacifolia.

VI.

J. ochrophylla.

VII.

J. perigonialis.

VIII.

J. occlusa.

IX.

J. strongylophylla.

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thecam paulo incrassata. *Theca* suberecta, parvula, oblonga, basi obconica, seta concolor, apophysi angusta. *Peristomium* stramineum. *Operculum* theca paulo brevius, basi conoideum, rostro recto cylindraceo, margine submembranacea, semidiaphana. *Calyptra* thecæ parum longior, conico-subulata, fusco-lutea, apice rufo-fusca, basi ciliis plurimis confertis fimbriata.

A most beautiful little flaccid and tender species, of a pale straw colour, with the calyptra exactly as in *Dawsonia splachnoides*, Schwaeg., whence the species will form a connecting link between *Daltonia* and *Hookeria* (*Pterigophyllum*, Brid.). It is not improbable that this curious structure of the calyptra, which appears to be of very rare occurrence in the genus, may, in conjunction with the erect theca and some other peculiarities, prove of sufficient importance to separate these species from all other *Hookeriæ*.

PLATE LXII. *Fig.* I.—1, a specimen of the *natural size*; 2, a leaf; 3 and 4, theca; 5, operculum; 6, calyptra:—*magnified*.

3. HOOKERIA *denticulata*, Hook. fil. et Wils.; caule suberecto parce ramoso, foliis laxe imbricatis subquadrifariis lateralibus distichis intermediis appressis subrotundis grosse dentatis nervo ad medium evanido, theca pendula ovata, operculo rostrato, calyptra glabra. (TAB. LXII. Fig. II.)

HAB. Lord Auckland's group and Campbell's Island; in wet and marshy places, not uncommon, rare in fruit, which was only seen in the former locality.

Caules pollicares, parce ramosi; rami compressi, subincurvi, siccitate rigidi. *Folia* configuratione sat varia, late oblonga, ovata, v. obovata, obtusa, musco recenti micantia, pellucida, siccitate nigricantia, subcrispa, fragilia, madore tardius nervo valido plerumque furcato infra medium evanido interdum brevissimo, areolis majusculis hexagonis; *perichætialia* parva, ovata. *Seta* ½ unc. longa, crassa, vix torta, rubra. *Theca* cernua v. pendula, elliptica, basi attenuata, rufo-brunnea, opaca. *Peristomii dentes externi* flavi, lineis duobus rubris notati. *Operculum* rostratum, rectum, theca brevius. *Calyptra* conico-mitræformis, glabra, carnosa, rufo-fusca.

Our specimens want both the operculum and calyptra, the descriptions of which are taken from Tasmanian specimens. This species bears much affinity to *H. quadrifaria*, but is smaller and readily distinguishable by its dentate leaves. In general aspect it approaches the *H. cristata*.

PLATE LXII. *Fig.* II.—1, specimen from Cape Horn of the *natural size*; 2, a Campbell's Island specimen of the *natural size*; 3 and 4, leaves:—*magnified*.

4. HOOKERIA *pennata*, Smith; caule erecto simplici, foliis bifariis verticalibus ovato-lanceolatis serratis subenerviis, stipulis orbiculatis mucronulatis serratis, seta perbrevi, theca suberecta ovata, operculo conico acuminato. H. pennata, *Smith, in Linn. Trans.* vol. ix. p. 277. *Hook. Musc. Exot.* t. 163. Cyathophorum, *Brid. Bryol. Univ.* vol. ii. p. 722.

Var. β, *minor*; foliis rotundatis concavis fusco-olivaceis. (TAB. LXII. Fig. III.)

HAB. Lord Auckland's group; in the dark woods, barren: var. β, on decaying stumps of trees by a water-course, also barren.

The var. β is certainly not entitled to rank as a species, though at first sight its difference appears striking. Another form, probably also a variety, with very narrow leaves, has been sent from Assam by Mr. Griffith, under the name of *Neckera Adiantum*, Griff. MSS. *Hookeria pennata*, on account of its accessory leaves (stipules), appears most naturally allied to those species included by Bridel in *Hypopterygium*; it is only in the much advanced state that the vaginula becomes hollow and cup-shaped, whence Bridel's name of *Cyathophorum* is scarcely tenable, considering that the vaginula in other species of *Hookeria* is very turgid. The calyptra is truly mitriform.

We have New Zealand specimens of this magnificent moss, nearly a foot long and loaded with thecæ.

PLATE LXII. *Fig.* III.—1, a specimen of the *natural size*; 2 and 3, leaves:—*magnified*.

XXXIV. HEPATICÆ, *Juss.*

(By Dr. Thomas Taylor* and J. D. Hooker.)

1. JUNGERMANNIA, *L.*

(1. Gymnomitrion, *Nees.*)

1. Jungermannia *stygia,* Hook. fil. et Tayl.; perpusillâ, caule erecto laxe cæspitoso ramoso, foliis erectis subimbricatis appressis obovatis obtusis integris v. emarginatis, perichætiis rotundatis caule duplo latioribus. (Tab. LXII. Fig. IV.)

Hab. Campbell's Island; on rocks on the hills, growing amongst other *Hepaticæ* and Mosses.

Caules 2–3 lin. longi, crassiusculi, superne fusco- v. atro-purpurei, inferne fusco-olivacei vage ramosi; ramis divaricatis. *Folia* minima, subsecunda, alterna, vix imbricata, obovata v. oblonga, apices versus obtusos late emarginata, segmentis obtusis, rarius integra, margine superiore interdum scariosa. *Perichætia* subrotunda, foliis imbricatis, latiusculis, ad apices albidos plerumque scariosis.

A very inconspicuous little species, approaching *J. concinnata* (Lightf.), of which it is probably the representative in these islands. The leaves are, however, more distant, never bifid at the apex, the stems slenderer and the perichætia sessile and round. Its colour is like *Gymn. adustum,* Nees, a German plant, with short and simpler stems.

Plate LXII. *Fig.* IV.—1, a plant of the *natural size*; 2, a specimen, *magnified*; 3, stem and leaves; 4, leaf: both *magnified.*

2. Jungermannia *acinacifolia,* Hook. fil. et Tayl.; atro-fusca, caulibus erectis cæspitosis parce ramosis, foliis secundis ante imbricatis erectis acinaciformibus integerrimis apice rotundatis demum scariosis concavis atro-purpureis. (Tab. LXII. Fig. V.)

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* The liberal manner in which the most eminent Naturalists in each department of Cryptogamic Botany have afforded their cooperation, has removed the diffidence I should otherwise have felt in publishing this difficult portion of the Antarctic Flora. To Dr. Taylor's extensive knowledge and keen discrimination I owe the diagnoses of the *Hepaticæ* and *Lichenes.* The large amount of *Jungermanniæ* which were collected, and the entangled manner in which they delight to grow, rendered their separation a task demanding no ordinary patience and skill. Further, the microscopic investigation of eighty different species and a much greater number of specimens, entailed upon that gentleman and myself an amount of labour which we would fain hope has resulted in the correct determination of a collection so unexpectedly novel and interesting. After a thorough examination by Dr. Taylor, the specimens have passed twice under my own eyes, preparatory to the completion of the descriptions and the drawings, which latter have been further revised by Mr. Fitch when transferring them to the stone; this severe scrutiny will, it is to be trusted, reduce the errors into which I should otherwise personally have fallen, to a very small number.

Amidst so many new species it is not to be wondered that some are advanced with hesitation. In a tribe of plants so minute, a casual resemblance or a slight variation may often lead (without reference to the microscope) on the one hand to a union of what are not the same, and on the other to a multiplication of species. The difficulty of holding a middle course between these extremes is acknowledged. Our plan, when investigating the plants of new countries, so remote from any whose productions are explored, has been, to consider tangible characters, though often slight, as specific differences; at the same time stating the amount of difference, and hoping that future observers may obtain such materials as will either unite these with the plants of other lands, or tend still further to prove them distinct.

HAB. Campbell's Island; on rocks near the hill-tops, growing amongst mosses, &c.

Cæspites luride atro-purpurei, vix 1 unc. alti, supra muscos elati. *Caules* sæpius curvati, anni præteriti nunc ad apices innovationibus binis instructi. *Folia* ita imbricata et secunda ut caulis superne profunde canaliculata appareat, opaca, acinaciformia, margine posteriore lente recurva, anteriore convexa.

A larger plant than the former, or than *J. concinnata*; of a rigid habit, more sparingly branched and of a fuscous or blackish purple colour, with leaves so densely imbricated all round the stem, that the latter appears terete and grooved down the front. It is perhaps more nearly allied to the *J. lutescens*, Gottsche, but its leaves are broadly rounded, of a thinner texture, the shoots pale lemon-colour, the whole plant of a different habit, and further, the latter is furnished with stipules.

PLATE LXII. *Fig.* V.—1, a specimen of the *natural size*; 2, another specimen, *magnified*; 3, part of stem and leaves; 4, a leaf; both *magnified.*

3. JUNGERMANNIA *ochrophylla*, Hook. fil. et Tayl.; pallide viridis, caule suberecto v. decumbente parce ramoso, foliis distichis laxe imbricatis erecto-patentibus late obovatis v. subquadratis breviter bifidis segmentis obtusis concavis, stipulis valde inconspicuis v. nullis. (TAB. LXII. Fig. VI.)

HAB. Lord Auckland's group; amongst mosses on rocks at the tops of the hills, altitude 1200 feet.

Laxe cæspitosa. *Cæspites* pallide virescentes, 1 unc. lati et ultra. *Caules* subunciales, superne subincrassati, irregulariter pinnatim ramosi. *Folia* semiamplexicaulia, imbricata, patentia, subdivaricata, obovata, basi angusta, concava, bifida, sinu brevi, segmentis longitudine vix $\frac{1}{4}$ folii obtusis. *Stipulæ* dum adsint minimæ, oblongæ, apicibus vix emarginatis.

This has more the appearance of the European *J. minuta* than of any of its congeners, but the leaves are not so abruptly truncate, the notch at their summits is much narrower and their sides more rounded. It is a more conspicuous plant than either of the two preceding, of a looser texture and paler colour, and has patent leaves. From *J. perigonialis*, nobis, it may be distinguished by its greater size, paler hue, stout stems and more crowded leaves, which are loosely reticulated and have obtuse segments.

PLATE LXII. *Fig.* VI.—1, specimen of the *natural size*; 2, a portion of a branch with leaves; 3, a leaf; both *magnified.*

(2. SARCOSCYPHUS, *Corda.*)

4. JUNGERMANNIA *perigonialis*, Hook. fil. et Tayl.; pusilla, caule cæspitoso erecto subramoso, foliis approximatis suberectis secundis obovatis v. ovato-rotundatis inæqualiter bifidis subobtusis basi semi-amplexicaulibus marginibus integerrimis, perigoniis ovato-oblongis, foliis perigonialibus arcte imbricatis subintegris valde concavis basi ventricosis saccatisve. (Tab. LXII. Fig. VII.)

HAB. Lord Auckland's group; on rocks, at the tops of the hills.

Cæspites densi, luride brunnei, 2–3 unc. diametro. *Caules* graciles, intertexti, sub $\frac{1}{2}$ unc. longi, crassiusculi. *Folia* laxe imbricata, subsecunda, curvata, breviter bifida, sinu obtuso, segmento inferiore plerumque majore. *Perigonia* plurima, terminalia v. ramulis ultimis lateralia, basi subampullacea v. in sacculum producta, apicibus brevibus, rarius emarginatis, nunc bifidis.

No calyces have been observed upon this plant, which is so nearly allied to the *J. Funckii*, Mohr, that they might easily be confounded; the latter differing in its short stems and more closely imbricated leaves, which are, as well as those of the convolute perigonia, acutely bifid; the segments of all are acute. It also a good deal resembles *J. stygia*, nobis, though the plant is larger and the leaves have a very different direction.

PLATE LXII. *Fig.* VII.—1, a specimen of the *natural size*; 2, front view and 3, lateral view of portion of stem and leaves; 4, leaf; 5, ditto of perigonium; *magnified.*

(3. AULICULARIA, *Corda.*)

5. JUNGERMANNIA *occlusa*, Hook. fil. et Tayl.; caule erecto laxe cæspitoso, ramis binis simplicibus v. parce ramosis, foliis appressis reniformi-rotundatis basi sublobulatis in ramos decurrentibus integerrimis concaviusculis. (TAB. LXII. Fig. VIII.)

HAB. Campbell's Island; in moist boggy places.

Caules biunciales, luride v. pallide virescentes, inferne brunnei v. nigrescentes. *Folia* olivacea, pallide flava v. brunnea, superne arcte in capitulum circinnatum imbricata, areolis crebris minimis.

This is evidently the southern representative of *J. compressa*, from which it is distinguishable by the inferior margin of the leaf being produced into a lobe, as also by the closer and smaller cells of the leaves. In the European plant the lower lobe of the leaf is decurrent on the stem, but does not form a lobe nor is it produced below the junction of its inferior margin with the branch.

PLATE LXII. *Fig.* VIII.—1, a specimen of the *natural size*; 2 and 3, leaves; *magnified.*

6. JUNGERMANNIA *strongylophylla*, Hook. fil. et Tayl.; minuta, caulibus cæspitosis erectis ramosis, foliis minimis suberectis laxe imbricatis secundis rotundatis integerrimis concaviusculis, stipulis truncatis bifidis, calyce oblongo subcompresso ore rotundato bilabiato. ((TAB. LXII. Fig. IX.)

Var. β, *minima*; gracilis, foliis minoribus.

HAB. Campbell's Island; on the hills: var. β, Lord Auckland's group; in wet places at the roots of grasses, &c.

Cæspites brunnei v. virescentes, supra muscos prostrati v. iis immixti. *Caules* graciles, subflexuosi. *Folia* minima, laxe cellulosa, pellucida, cellulis marginalibus majoribus, madore sub lente pallide fusco-olivacea. *Stipulæ* oblongæ v. obovatæ, truncatæ, bifidæ. *Folia perichætialia* elongata calyce oblongo-obovato ore crenato paulo longiora. *Varietas* β, minor evadit, foliis remotis perigoniisque instructa. *Perigonia* plurima, lateralia, e foliis majoribus confertis ventricosis spicatis formata.

There is no northern congener with which this will bear any close comparison; the form of the calyx and perichætial leaves resemble the *J. crenulata*; the present is, however, a very much smaller plant, distinctly stipulate, of a different habit and with rounder leaves.

PLATE LXII. *Fig.* IX.—1, a specimen of the *natural size*; 2, the same, *magnified*; 3, portion of branch with leaf and stipule; *magnified.*

(4. GOTTSCHEA, *Nees.*)

7. JUNGERMANNIA *Lehmanniana*, Lind. *in Lehm. Pugill. Plant. IV.* p. 60. *Gottsche, Nees et Lindenb. Synops. Hepat.* p. 20. G. Hombroniana, *Mont. in Voy. au Pole Sud. Bot. Crypt.* t. 16. f. 1. *et in Ann. Sc. Nat.* 1843. p. 243.

HAB. Lord Auckland's group; on rocks and at the roots of trees in the woods, abundant.

Also a native of Tasmania and of New Holland. We quite agree with the authors of the 'Synopsis Hepaticarum' in uniting *G. Hombroniana*, Mont. with this.

BOTANY BRANCH OF THE

I

J. ciliigera.

II.

J. hemicardia.

III.

J. cognata.

IV

J. pleurota.

V

J. fuscella.

J.D.H. & W. Fitch del.

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8. JUNGERMANNIA *pinnatifolia*, Hook. Musc. Exot. t. 114. *Gottsche, Lindenberg et Nees, Synops. Hepat.* p. 22. G. ciliigera, *Hook. fil. et Tayl. in Hook. Lond. Journ. of Bot.* vol. iii. p. 376. (TAB. LXIII. Fig. I.)

HAB. Lord Auckland's group; growing amongst mosses in the woods, often forming large tufts by itself.

This noble plant was described under the name of *J. ciliigera* in the 'London Journal of Botany,' quoted above. The specimens differed from the published figure in the lobes of the leaf being considerably unequal, and especially in their being produced at their union below into a ciliated wing or keel, characters which appear to have been overlooked in the '*Musci Exotici*.' We have added a correct drawing of this species, which was prepared before we were aware that it was an already published plant.

PLATE LXIII. *Fig.* I.—(sub nom. *J. ciliigera*), 1, a specimen of the *natural size*; 2, the same, *magnified*; 3 and 4, leaves; 5, calyx; *magnified.*

9. JUNGERMANNIA *Balfouriana*, Tayl.; caulibus erectis laxe cæspitosis subsimplicibus squamosis, foliis subimbricatis patentibus lobo ventrali oblongo-falcato subtus apicem versus cristato cristis tribus ciliatis, dorsali semi-ovato utroque obtuso ciliato, stipulis quadrato-rotundatis quadrifidis.

HAB. Lord Auckland's group; in woods near the sea.

Laxe cæspitosa, pallide viridis. *Caules* e caudice repente erecti, 3 unc. longi, squamis ciliatis lanceolatis obsiti. *Folia* conferta, vix imbricata, oblongo-lanceolata, obtusa, superne lobo verticali aucta. *Stipularum* laciniæ obtusæ, ciliatæ.

The *Gottscheæ* of Nees are a group of *Jungermanniæ* almost confined to the southern hemisphere; one is a native of the Philippine Islands, and a few others inhabit the Peninsula of India and the Island of Java; but the larger proportion frequent the humid and temperate woods of New Zealand, from whence we have received no less than eight species; they are certainly the *nobiles* of the order *Hepaticæ*. *J. Balfouriana* is most nearly allied to *Gottschea Blumii* of Nees, a Java plant; from which it may be discriminated by its smaller size, less falcate leaves, more entire cauline scales, and above all by the quadrifid stipules. It was first received by Dr. Balfour from New Zealand, though probably originally discovered by Mr. Colenso in that island, or by the Antarctic Expedition in Lord Auckland's group. A figure of it will be given in the Flora of New Zealand.

10. JUNGERMANNIA *pachyphylla*, Lehmann, *Pugillus Plant. VI.* p. 61. *Gottsche, Nees et Lindenb. Synops. Hepat.* p. 19.

HAB. Lord Auckland's group; on the bare ground, at an elevation of 600–800 feet, very rare.

Originally discovered by Du Petit Thouars in Tristan d'Acunha. Our specimens are small and very imperfect; growing on the bare ground in exposed places, the plant is with difficulty detected.

(5. PLAGIOCHILA, *Nees et Mont.*)

11. JUNGERMANNIA *fasciculata*, Lind. *Sp. Hepat. Fasc.* 1. p. 7. n. 2. t. 1. *Gottsche, Lind. et Nees, Synops. Hepat.* p. 27.

HAB. Lord Auckland's group; forming large tufts in the woods.

A very fine species, hitherto only known as a native of New Holland. The stems are rigid and wiry, 2–3 inches long, branching upwards, with the branches erect and curving. The leaves are rather coriaceous, pale fuscous-yellow; it belongs to the same section with the European *J. spinulosa*, Dicks.

12. JUNGERMANNIA *hemicardia*, Hook. fil. et Tayl.; caule ascendente subtriangulari simplici v. ramoso, foliis dense arcteque imbricatis erecto-patentibus oblique et late ovatis basi cordatis apicibus rotundatis marginibus integris v. superne denticulatis subconcavis, margine anteriore recurvo posteriore basi in lobulum producto. (TAB. LXIII. Fig. II.)

HAB. Campbell's Island; on exposed rocks, near the summits of the hills.

Cæspites fusco-olivacei, 1–2 unc. lati. *Caules* una cum foliis triangulares, $\frac{3}{4}$–1 unc. longi, e rhizomate repente ascendentes, simpliciusculi, rigidi, antice plani, profunde canaliculati. *Folia* arcte imbricata, integra v. denticulata, opaca, dense cellulosa, areolis minimis hexagonis.

The leaves of this species meet back to back and are so closely imbricated that the stems appear triangular, their anterior margins not touching but leaving a space which appears like a groove running down the whole length of the stems, their recurved margins are rather tumid and decussate on the opposite face. In general habit this resembles the *J. punctata*, Tayl., a species recently detected both in Ireland and the Canary Islands, from which the gibbous or oblique leaves will readily distinguish it.

PLATE LXIII. *Fig.* II.—1, a specimen of the *natural size*; 2, a stem; 3, portion of a branch; 4 and 5, leaves; *magnified*.

13. JUNGERMANNIA *circinnalis*, Lehm. *Pugill. Plant. IV.* p. 64. *Lehm. et Lind. Spec. Hep.* p. 124. t. 27. *Gottsche, Lind. et Nees, Synops. Hep.* p. 53.

HAB. Lord Auckland's group; on rocks and on the hills, rare.

This agrees with authentic specimens of Lehmann's plant, except in the summits of the stems not being so remarkably circinnate as they are described. Such circinnate summits, however, are truly *perigonia*, whose leaves are smaller, more ventricose and erect than those of the stem; and further, some of them contain in their axillæ a single, rather large, pedicellated anther. Our specimens are about half an inch long, stout and curved; the leaves much more lax than in the former species.

14. JUNGERMANNIA *cognata*, Hook. fil. et Tayl.; parvula, fulva, caule erecto cæspitoso subsimplici v. ramoso, foliis laxe imbricatis patulis late ovatis v. elliptico-oblongis acuminatis paucidentatis basi attenuatis decurrentibus, margine anteriore vix recurvo, calyce terminali perichætio æquilongo vix curvato bilabiato labiis ciliato-dentatis. (TAB. LXIII. Fig. III.)

HAB. Lord Auckland's group; on alpine rocks, growing amongst stunted tufts of *Hymenophyllum multifidum*.

Cæspites diametro 1–2 uniciales, inferne brunnei, superne flavi v. flavo-fusci. *Caules* erecti, 1 unc. longi, subrigidi, inferne nudi, parce ramosi, anni præcedentis sæpius innovati, apicibus subcurvatis. *Folia* disticha, subpatentia v. divaricata, coriacea, apices versus 3–5 dentata, dente apicali majusculo acuminato, margine anteriore subrecurvo decurrente; folia perichætii erecta, elongata, magis dentata.

This has much affinity to the *J. decipiens*, Hook., a very variable species in the form of the leaves, but in which their cellules are much larger and more lax, while in this they are so dense as to be hardly distinguishable. The European plant differs further from the present in a character alluded to by the authors of the '*Synopsis Hepaticarum*,' who remark, "*J. decipiens* ab omnibus congeneribus margine dorsali folii inflexo nec reflexo differt."

PLATE LXIII. *Fig.* III.—1, a specimen of the *natural size*; 2, the same, *magnified*; 3 and 4, portions of stems and leaves; 5, perichætium and calyx; *magnified*.

15. JUNGERMANNIA *pleurota*, Hook. fil. et Tayl.; cæspitosa, caule erecto diviso v. parce ramoso, foliis

laxe imbricatis erecto-patentibus obovatis obtusiusculis apices versus parce crenato-dentatis basi angustatis, margine anteriore recurvo decurrente, calyce elongato-obovato basi nudo 4–5-alato ore contracto denticulato. (Tab. LXIII. Fig. IV.)

Hab. Lord Auckland's group; on moist rocks, near the summits of the hills.

Cæspites subdensi, 2–3 unc. diametro, pallide straminei v. virescentes. *Caules* $\frac{3}{4}$ unc. longi, subrigidi, simpliciusculi. *Folia* inferiora integra v. interdum unidentata, superiora apices versus plus minusve irregulariter crenato-dentata, omnia conformia, basi angustata antice decurrentia, apices versus rotundata, cellulis distinctis. *Calyx* terminalis, subpedicellatus, erectus, basi attenuatus, foliis caulinis vix duplo longior, alis 4–5 angustis planis v. rugosis, duobus oppositis interdum opacis, ore subtubuloso, crenato v. 4-fido, tandem fisso, foliis perichætii propriis nullis.

In external appearance this species very closely resembles the former, the leaves are, however, more loosely cellular, and in the structure of the calyx it widely differs. The Peruvian *Pl. gymnocalycina*, Lind., (Spec. Hep. p. 48. t. 10) has the calyx equally naked below and of a similar outline, but it is smooth and furnished with only two very obscure ribs, its foliage also is perfectly dissimilar and the whole plant is much larger. The wings of the calyx are formed out of deep folds of its membrane.

Plate LXIII. *Fig.* IV.—1, a specimen of the *natural size*; 2, calyx and upper leaves; *highly magnified.*

16. Jungermannia *fuscella*, Hook. fil. et Tayl.; caule subcæspitoso ascendente curvato vage ramoso, foliis laxe imbricatis patulis late oblongo-rotundatis basi obliquis subdeflexis siccitate verticalibus v. subcrispatis, margine anteriore recurvo subdecurrente, posteriore in lobulum latum producto denticulato, calyce terminali obovato truncato deflexo foliis perichætialibus breviore. (Tab. LXIII. Fig. V.)

Hab. Lord Auckland's group; in moist boggy places.

Cæspites late diffusi, 3–4 uncias diametro, luride olivacei v. fusco-atri. *Caules* $1\frac{1}{2}$–2 unciales, superne curvati, subgraciles, sæpe reflexi, siccitate una cum foliis subcrispatis subsquarrosis rigidi. *Folia* latiuscula, dense cellulosa, opaca, areolis subpunctiformibus, luce transmissa pallide fusco-olivacea, marginibus integris v. plerumque margine posteriore denticulato, supremis interdum omnino sub lente denticulatis.

In many respects this species resembles Montagne's *P. pusilla* (Voy. au Pole Sud, Bot. Crypt. tab. 16. f. 3), a species, judging from the plate, founded upon a young and imperfect specimen, and which we think exists in the Herbarium of the Expedition of a larger size. It differs from this in the deep serratures of the leaves, in the habit and colour and above all, in belonging (according to the figure) to a section having the leaves coadunate at the base. In the form of the foliage our plant more nearly resembles the *P. hemicardia*, nobis, but is very different in the disposition of the leaves on the stem. A few calyces were observed; they are very uniform, shorter than the perichætial leaves and concealed by them; some are proliferous, the stem being produced through their axis and exserted: this abnormal state has been observed in *J. Lyoni*, Tayl., and in several species of mosses, as in *Conomitrium Berterii*, Montagne (Cryptog. Boliv. t. 3. f. 4).

Plate LXIII. *Fig.* V.—1, a specimen of the *natural size*; 2, 3, 4, leaves; *magnified.*

(6. Jungermannia, *Nees.*)

17. Jungermannia *colorata*, Lehmann, *in Linnæa*, vol. iv. p. 366. *Gottsche, Nees et Lind. Synops. Hepat.* p. 86.

Hab. Lord Auckland's group and Campbell's Island; in various situations from the sea to the hill tops, abundant.

This is one of the most universally diffused species in the Southern Hemisphere, and especially abundant throughout the Antarctic regions; it bears considerable resemblance to the *J. orbicularis*, Mich., of North America, and to several other species.

18. JUNGERMANNIA *intortifolia*, Hook. fil. et Tayl.; sordide purpurea, cæspitosa, caulibus erectis subflaccidis simplicibus v. parce ramosis, foliis patentibus imbricatis concavissimis oblongo-rotundatis inæqualiter bi-quadrifidis segmentis acuminatis marginibus incurvis paucidentatis, stipulis imbricatis rotundatis emarginatis v. bifidis subdentatis valde concavis. (TAB. LXIV. Fig. I.)

HAB. Campbell's Island; in bogs on the hill-sides.

Cæspites lati, interdum supra terram extensi, flaccidi, sordide purpurei. *Caules* 1½–2 unc. longi, erecti, superne incrassati, subdichotome ramosi. *Folia* valde concava et ventricosa, quasi inflata, amplexicaulia, rarius integra, segmentis acuminatis, apicibus incurvis, substantia flaccida cellulosa laxe reticulata, vix pellucida. *Stipulæ* sæpe latere unico solummodo dentatæ, majusculæ, membranaceæ, dense imbricatæ.

The whole of the texture of this fine species is, when wet, so flaccid, that its large closely imbricated stipules are at first with difficulty distinguished from the leaves. It is perhaps more nearly allied to the *J. serrulata*, Sw. (Musc. Exot. t. 88), than to any other; still, this is quite a distinct plant, much larger, stouter, with the leaves somewhat fleshy and brittle, longer and more erect, of a lurid purple colour.

PLATE LXIV. *Fig.* I.—1, a specimen of the *natural size*; 2, portion of stem with leaves and stipules; 3, a leaf; both *magnified*.

19. JUNGERMANNIA *schismoides*, Montagne *in Voy. au Pole Sud, Bot. Crypt.* t. 17. fig. 1. *et in Ann. Sc. Nat.* 1843. p. 250. *Gottsche, Lindenb. et Nees, Syn. Hepat.* p. 81.

HAB. Lord Auckland's group and Campbell's Island; creeping amongst mosses and other *Hepaticæ*.

Gottsche (Synopsis, l. c.) compares this species with *J. piligera*, Nees, a plant of Java; it is perhaps more like *J. incumbens*, Lehm. of Tristan d'Acunha, differing by the greater size and nearly equal segments of the leaves. These have no near ally in Europe.

20. JUNGERMANNIA *multicuspidata*, Hook. fil. et Tayl.; laxe cæspitosa, subramosa, prostrata, ramis inferne radicantibus apicibus ascendentibus, foliis distantibus suberectis laxis obovatis bi-tri-quadrifidis segmentis acutis v. acuminatis laxe cellulosis, calyce terminali v. laterali elongato cylindraceo ore dentato.

HAB. Campbell's Island; in pools, near the sea.

Cæspites inter *Sphagna* repentes vel in aquam subnatantes, rarius supra terram in umbrosis, 1–2 unc. diametro, laxe intertexti, pallide albido-straminei. *Caules* subramosi, plerumque ad basin calycis innovationibus binis instructi, graciles, laxe foliosi. *Folia* pellucida, valde membranacea, ad medium divisa, sinubus obtusis, segmentis subdivaricatis; *perichætialia* erecta, laxe imbricata, plerumque tri-quadrifida. *Calyx* perichætio bis longior, elongatus, cylindraceus, ore contracto inæqualiter 3–5 dentato, latere fissus, infra orem obscure sulcatus.

This species has indeed many points in common with *J. bicuspidata*, the same pale colour, loose leaves with large cellules, acuminated segments, and an elongated calyx. It is marked by the smaller size, the stem-leaves being more erect, the division of the leaf deeper, and the calyx more generally terminal than in *J. bicuspidata*, L.

21. JUNGERMANNIA *turgescens*, Hook. fil. et Tayl.; caule cæspitoso procumbente ramoso, foliis imbricatis secundis suberectis concavis reniformi-rotundatis integerrimis, margine anteriore decurrente, stipulis

BRANCH OF THE

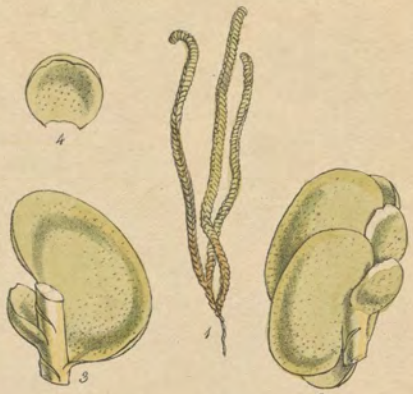
I.

J. intortifolia.

II.

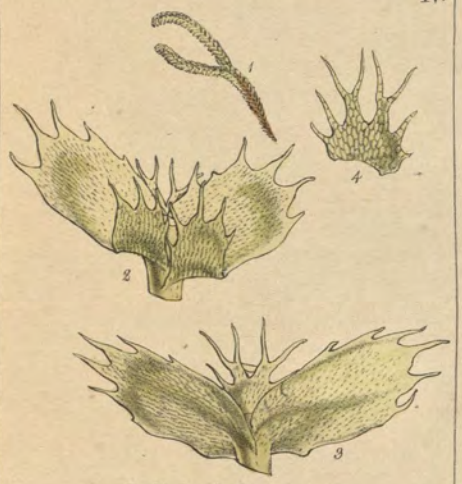
J. turgescens.

III.



J. notophylla.

IV.



J diplophylla.

V.

J. cymbalifera.

VI.

J. tenacifolia.

VII.

J. bispinosa.

VIII.

J. grisea.

IX.

J. perpusilla.

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obovatis rotundatisve integerrimis apice bifidis, calyce terminali compresso oblongo truncato ore integerrimo v. obscure lobato. (Tab. LXIV. Fig. II.)

Hab. Lord Auckland's group; on the ground, near the tops of the hills.

Cæspites 2–3 unc. lati, pallide flavo-olivacei. *Caules* vix unciales, intertexti, vage ramosi, prostrati, apicibus ascendentibus. *Folia* fere reniformia, e marginibus valde incurvis concava, subpellucida, areolis minutis. *Stipulæ* parvæ, sinu brevi, segmentis subacutis. *Calyx* in ramo anni præteriti terminalis, compressus, oblongus, basi angustatus, vix curvatus.

The leaves on the fertile shoots of this species rapidly increase in size upwards, becoming more densely imbricated; the terminal pair or perichætial leaves are the largest and most erect.

Those species of *Jungermannia* with round, concave, imbricating leaves and bifid stipules, which inhabit the north of Europe, have their calyces subcylindrical or ovate; the present differs from all of them in that organ being decidedly compressed and truncate, appearing like a flattened cylinder after the egress of the capsule. It may by some be considered as forming a separate genus, to which perhaps our *J. strongylophylla* should be referred.

Plate LXIV. *Fig.* II.—1, a specimen of the *natural size*; 2, back view of stem, leaves, and stipules; 3, front view of leaf and stipule; 4, back view of leaf; 5, stipule; 6, calyx; *magnified.*

22. Jungermannia *notophylla*, Hook. fil. et Tayl.; straminea, caule erecto subsimplici v. ramoso, foliis numerosissimis arcte imbricatis patenti-recurvis reniformi-rotundatis valde concavis integerrimis marginibus incurvis, stipulis ovato-rotundatis obtusis v. emarginatis integriusculis. (Tab. LXIV. Fig. III.)

Hab. Lord Auckland's group; on banks, in the woods near the sea, forming large patches.

Cæspites majusculi. *Caules* graciles, teretes, superne subincrassati et incurvi, pallide straminei, flaccidi, 2 unc. longi. *Folia* densissime imbricata, marginibus valde incurvis, quasi inflata, substantia molli, flaccida, subpellucida, subauriculiformia, obliqua, antice decurrentia, carnosa. *Stipulæ* valde concavæ, latæ, plerumque integræ, magnitudine $\frac{1}{4}$ foliorum.

This curious and fine species is of a peculiarly flaccid and as it were greasy texture when moist; there is no European or exotic *Jungermannia* known to us with which it can be at all compared.

Plate LXIV. *Fig.* III.—1, a specimen of the *natural size*; 2, portion of stem with leaves and stipules; 3, leaf and stipule; 4, stipule; *magnified.*

23. Jungermannia *cymbalifera*, Hook. fil. et Tayl.; caule laxe implexo suberecto v. procumbente subsimplici tereti curvato, foliis arcte denseque imbricatis erecto-patentibus oblique rotundatis serrulatis concavis margine anteriore sursum in appendiculam obovato-rotundatam producto, stipulis transversis latissimis arcte imbricatis obscure trilobis integerrimis, calyce laterali ovato-oblongo subcompresso plicato ore dentato. (Tab. LXIV. Fig. V.)

Hab. Lord Auckland's group; on the roots of old trees in the woods, rare.

Cæspites laxi, pallide virescentes v. lutescentes. *Caules* subunciales, teretes, intertexti, simplices v. parce ramosi, flexuosi, prostrati, apicibus sæpius incurvis. *Folia* densissime imbricata, subsecunda, marginibus anticis approximatis, appendicibus seu auriculis pedicellatis e membrana duplici formatis instructa, substantia subcarnosa, flaccida, pellucida, cellulis distinctis. *Calyx* vere lateralis, basi subtumidus, infra orem compressus, longitudinaliter plicatus, foliis perichætialibus paucis.

A singularly beautiful and easily recognised plant, with much the habit and external appearance of *J. notophylla*, nobis, but most distinct from it and from any other species. The appendages of the leaves and the broad obscurely lobed stipules all closely imbricating up the stem give the appearance of a very complicated structure. Like the

J. notophylla it swells much in moistening, and assumes a stout and as it were greasy appearance, from the peculiar texture of the distended cells. The broad stipules, reaching nearly across the back of the stem, resemble those of *J. Billardieri*, and are as regular and close along the whole plant as the scales of a snake.

PLATE LXIV. *Fig.* V.—1, a specimen of the *natural size*; 2, front; 3, back, and 4, side view of stem; 5, a leaf; 6, calyx and perichætium: *magnified.*

24. JUNGERMANNIA *diplophylla*, Hook. fil. et Tayl.; caule procumbente laxe implexo divaricatim ramoso, foliis distichis arcte imbricatis divaricatis bilobis lobis plica conduplicatis ciliatis v. ciliato-dentatis, lobo superiore erecto patente multo minore ovato subacuto substipuliformi, inferiore patente late ovato obtuso, stipulis subquadrato-rotundatis bifidis segmentis ciliato-dentatis. (TAB. LXIV. Fig. IV.)

HAB. Lord Auckland's group; creeping over the caudices of *Ferns*, rare.

Caules subsolitarii, vage repentes, v. cæspites laxos planos sub 1 unc. diametro formantes, planiusculi, procumbentes, parce divaricatim ramosi, 1 unc. longi, latiusculi, albidi. *Folia* tenerrima, membranacea, laxe cellulosa, pellucida, dense imbricata, pulcherrime ciliato-dentata, valde concava, profunde biloba, lobis valde inæqualibus, lobo anteriore multo minore supra faciem anticam caulis extenso, stipulam referente; folium superius in sinu concavo inferioris receptum.

In some respects this remarkably beautiful species resembles a *Gottschea*, but it is in reality more allied to the genus *Scapania* of Lindenberg, from whose published characters it differs only in the presence of stipules! From what we have seen of the fructification, however, it widely departs from that group. The calyptra, in a specimen from M'Quarrie's River (New Holland), is globose, destitute of any calyx, surmounted by a truncated style, rough with numerous barren pistilla on its surface, and surrounded by scales; the scales are laciniate, the outermost the narrowest, and all enclosed in a triphyllous perichætium.

PLATE LXIV. *Fig.* IV.—1, a specimen of the *natural size*; 2, front, and 3, back view of a branch; 4, a stipule: *magnified.*

25. JUNGERMANNIA *minuta*, Crantz, *Hist. Groen.* p. 285. *Hook. Brit. Jung.* t. 44. *Gottsche, Nees et Lind. Synops. Hepat.* p. 120.

HAB. Lord Auckland's group; amongst mosses and other *Hepaticæ*.

This little species is probably not uncommon in the high southern latitudes, having been also gathered in Kerguelen's Land.

26. JUNGERMANNIA *tenacifolia*, Hook. fil. et Tayl.; caule rigido tenui laxe cæspitoso erecto subsimplici flexuoso, foliis distantibus patentibus rigidis tenacibus elliptico-oblongis obtusis integerrimis basi angustatis marginibus planis v. recurvis, stipulis conformibus minoribus integris bifidisve. (TAB. LXIV. Fig. VI.)

HAB. Lord Auckland's group; amongst other *Hepaticæ*, mosses, &c., in exposed situations near the tops of the hills.

Cæspites laxi, fusco-brunnei v. atri. *Caules* graciles, vix 1 unc. longi, rigidi, vix ramosi, flexuosi. *Folia* stipulis conformia semper patentia, dura, rigida, opaca, rarius recurva, fusco-brunnea.

We know of no species with which the present can at all be compared. The leaves and stipules are so nearly alike and so regularly stiff and patent, that the stems look pectinated with a triple row of spines, standing at regular intervals. This rigidity, combined with the slender habit, is very remarkable.

PLATE LXIV. *Fig.* VI.—1, a specimen of the *natural size*; 2, back, and 3, side view of portion of stem; 4, leaf; 5, stipule: all *magnified.*

27. JUNGERMANNIA *vertebralis.*—Scapania? vertebralis, *Gottsche, Lind. et Nees, Synops. Hepat.* p. 72.

HAB. Lord Auckland's group; on trees, very rare.

Our specimens of this beautiful species are smaller, but otherwise they coincide with those of Tasmania. It is very closely allied to the *J. chloroleuca*, nobis, from Cape Horn, and also to the *J. densifolia*, Hook.

(7. GYMNANTHE, *Tayl.*, subgenus novum.)

Receptaculum commune terminale, descendens, obconicum. *Calyx* nullus. *Capsula* quadrivalvis, seta suffulta. *Elateres spirales* seminibus immixti. *Antheræ* in foliorum axillis liberæ, pedicellatæ.—Stirps *exstipulata*; perichætia *majora*; folia *caulina infima minima*. Tayl. MSS.

28. JUNGERMANNIA *saccata*, Hook.; *Musc. Exot.* t. xvi. J. tenella, *nobis in Lond. Journ. of Botany*, vol. iii. p. 377, 560 and 579.

HAB. Lord Auckland's group; in the woods, abundant.

The figure of this plant, in the '*Musci Exotici*,' does not well accord with our species, in which the upper margin of the leaf is more produced into a lobe, the apex blunter and sometimes emarginate or even bilobed, the lower margin more recurved and the whole base broader.

To this group may be added the *Jungermannia* (*Acrobolbus*, Gottsche) *Wilsoni*, Nees, and the following.

29. JUNGERMANNIA *Urvilleana.*—Scapania Urvilleana, *Mont. in Voy. au Pole Sud, Bot. Crypt.* t. 16. f. 2. *et in Ann. Sc. Nat.* 1843. p. 247. *Gottsche, Lind. et Lehm. Syn. Hepat.* p. 63.

HAB. Lord Auckland's group; mixed with other *Hepaticæ* in the woods.

This species, rather variable in its form, especially of the margins of its leaves, is a native of Tasmania, as well as of Lord Auckland's group and the Straits of Magalhaens, where it was first detected by D'Urville.

(8. LOPHOCOLEA, *Nees.*)

30. JUNGERMANNIA *bispinosa*, Hook. fil. et Tayl.; caulibus procumbentibus implexis subramosis, foliis laxe imbricatis secundis erecto-patentibus oblongo-ovatis v. quadratis obtuse emarginatis bifidisve segmentis divaricatis acuminatis basi lata decurrente, stipulis minimis bipartitis segmentis subulatis integerrimis v. utrinque subdentatis. (TAB. LXIV. Fig. VII.)

HAB. Campbell's Island; on moist ground and trunks of trees in the woods.

Cæspites implexi, 2–3 unc. lati, pallide straminei. *Caules* prostrati, subflexuosi, graciles. *Folia* secunda, remota, bifida; stipulis bifidis, rarius multifidis.

Very nearly allied to the *J. bidentata*, L., differing in its smaller size, more remote and suberect leaves, which are narrower, their cellules more minute, their emargination deeper, and in the stipules being less and generally not so compound.

PLATE LXIV. *Fig.* VII.—1, a specimen of the *natural size*; 2, portion of the stem, *magnified*.

31. JUNGERMANNIA *lenta*; Hook. fil. et Tayl.; caulibus elongatis cæspitosis subsimplicibus flexuosis

flaccidis ascendentibus, foliis contiguis patentibus distichis oblongis bifidis segmentis divaricatis acuminatis integerrimis, stipulis minutis lanceolatis bipartitis integerrimis, calyce obovato compresso trigono, ore bilabiato dentato.

HAB. Lord Auckland's group; in large tufts upon the moist trunks of trees.

Cæspites lati, interdum 2–3 unciales, supra albidi v. pallide straminei, inferne dilute brunnei. *Caules* 1–2 unciales, valde intertexti, elongati, graciles, simplices v. rarius ramosi, apices versus paulo curvati, flaccidi, cellulosi. *Folia* e caule prostrato suberecta, paulo divergentia, hinc quasi biserialia, oblonga, versus medium sublatiora, emarginata v. bifida, sinu obtuso, segmentis acuminatis; *perichætialia* conformia, erecta. *Stipulæ* bifidæ, integerrimæ, rarius basi extus unidentatæ. *Calyx* membranaceus, pellucidus, trigonus, latere anteriore latiore, angulis incrassatis opacis, ore majusculo bilobo, lobis acuminatis argute dentatis. *Capsula* ovalis, pedunculo $\frac{1}{4}$ unc. longo.

This species is very nearly allied to and apparently intermediate between the *J. bidentata*, L. and *J. perpusilla*, nobis, the former in particular, from which it is only to be distinguished by the smaller size and the entire segments of the stipules; from the latter it may be known by being at least double the size, by the more tufted habit, the deeper emargination of the leaf, their more acuminate segments and larger cells, and by the deeper division of the stipules. There are numerous radicles issuing from the stem throughout its whole length, their position is immediately above the stipules, whence it seems highly probable that, when less tufted, the plant may be wholly creeping. This species will be figured in the Flora of New Zealand, of which island also it is a native.

32. JUNGERMANNIA *perpusilla*, Hook. fil. et Tayl.; cæspitosa, caulibus ascendentibus subramosis, foliis erecto-patentibus subsecundis oblongo-ovatis bifidis segmentis divaricatis subobtusis integerrimis, stipulis minutis oblongis bifidis v. rarius laceris, perigoniis ovatis. (TAB. LXIV. Fig. IX.)

HAB. Campbell's Island; mixed with other *Hepaticæ* and mosses, sparingly.

Cæspites parvi, pallide flavi, laxi. *Caules* vix 3 lin. longi, subramosi, graciles. *Folia* patentia, ovata, basi lata, bifida v. rarius trifida, sinu obtuso. *Stipulæ* diametro caulem æquantes, in segmentis 2 æquilongis integris v. rarius sectis divisæ. *Perigonia* e foliis ventricosis imbricatis ad apices recurvis in spicam brevem ovatam dispositis. *Perichætii* abortivi folia elongata, subdentata, sinu minus profunda.

Under the preceding, to which this bears most affinity, we have pointed out their relative peculiarities.

PLATE LXIV. *Fig.* IX.—1, a specimen of the *natural size*; 2, a portion of a branch, *magnified.*

33. JUNGERMANNIA *grisea*, Hook. fil. et Tayl.; cæspitosa, procumbens, caulibus implexis ramosis, foliis patentibus approximatis supremis congestis oblongo-rotundatis integerrimis marginibus recurvis, stipulis bipartitis segmentis hinc unidentatis v. rarius multipartitis, calyce terminali oblongo trigono compresso ore dentato. (TAB. LXIV. Fig. VIII.)

HAB. Lord Auckland's group; creeping amongst mosses, &c., rare.

Cæspites depressi, plani, fusco-olivacei. *Caules* 1 unc. longi, vage ramosi, flexuosi, apicibus ascendentibus. *Folia* inferiora disticha, marginibus recurvis, convexa, suprema appressa, secunda, in capitulum congesta, substantia crassiuscula, luride flava, subpellucida, cellulis minimis. *Calyx* 1 lin. longus, trigonus, angulis incrassatis opacis, latere inferiore latiore, ore triangulari dentato. *Perichætii folia* tria, erecta, horum duo superiora majora magisque elongata quam in foliis caulinis, rotundata, integra; tertium v. stipulare, oblongum, emarginatum, marginibus recurvis.

This very closely resembles the *L. discedens*, Nees; it is, however, a larger species, of a paler colour. The leaves are erecto-patent and not recurved, their tops entire, the stipules are divided, and each segment is again divided or bears a tooth at the outer margin.

I.

J. spinifera.

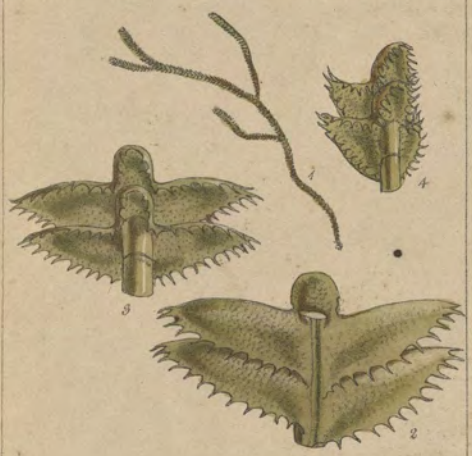
II.

J. planiuscula.

III.

J. australis.

IV.



J. leucophylla.

V.

J. patentissima.

VI.

J. albula.

VII.

J. hippuroides.

VIII.

J. nutans.

IX.

J. polyacantha.

W.W. J.D.H & W.F del.

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PLATE LXIV. *Fig.* VIII.—1, a specimen of the *natural size*; 2, portion of branch; 3, perichætium and calyx: both *magnified.*

34. JUNGERMANNIA *multipenna,* Hook. fil. et Tayl.; procumbens, caulibus implexis ramosis, foliis distichis patentibus imbricatis obovatis acutis obtusisve truncatis v. emarginatis margine anteriore gibboso inferiore decurrente, stipulis subquadratis varie sectis plerumque bifidis segmentis divisis v. quadrifidis rarius irregulariter dentatis interdum in lacinias quatuor divaricatas subulatas fissis, calyce oblongo triquetro ala superiore latiore ciliato-dentata.

HAB. Lord Auckland's group; on the ground and on the bark of trees in the woods.

Cæspites horizontales, appressi, pallide brunnei v. rufi, rarius virescentes. *Caules* vix 1 unc. longi, vage ramosi. *Folia* late ovato-oblonga, exacte opposita, horizontaliter patentia, forma apices versus varia, plerumque truncata v. late emarginata, laxe cellulosa, pellucida, superiora interdum utrinque cum stipulis connata; *perichætialia* erecta, dentata. *Stipulæ* variæ, interdum subintegræ, marginibus irregulariter dentatis, sæpius late quadratæ, quadrifidæ v. bifidæ, segmentis basi extus unidentatis, rarius quadripartitæ, laciniis divaricatis elongato-subulatis.

This plant has so many points in common with *J. heterophylla,* Schrad., that we retain it as a separate species with much hesitation, and chiefly on account of the larger cells of its more rounded leaves, which are more gibbous above and narrower towards the apex; the broad stipules, which are never ovate, and also on account of the longer calyx, of which the lips are more frequently and deeply toothed, as are the perichætial leaves. Through a mistake the specific character and description of *J. intortifolia,* nobis, were repeated under this species in the 'London Journal of Botany,' vol. iii. p. 381.

35. JUNGERMANNIA *spinifera,* Hook. fil. et Tayl.; caulibus prostratis laxe implexis subramosis, foliis densis arcte imbricatis erecto-patentibus tenerrimis laxe reticulatis ovato-oblongis basi decurrentibus marginibus recurvis bifidis segmentis elongatis subulatis, stipulis majoribus latissimis reniformibus sexfidis segmentis lanceolatis. (TAB. LXV. Fig. I.)

HAB. Lord Auckland's group; on wet rocks near the tops of the hills, scarce.

Pallide flava v. albo-virescens, inter alias *Hepaticas* repens. *Caulis* ½ unc. longus, apicem versus attenuatus recurvus, antice canaliculatus. *Folia* arcte imbricata basi latiora antice approximata, margine inferiore longe decurrente, sinu obtuso, segmentis acuminatis divaricatis, cellulis majusculis laxis pellucidis. *Stipulæ* plerumque conformes, pro genere maximæ, basi concavæ, amplexicaules, in lacinias sex erectas v. divergentes subulatas fissæ. *Antheræ* inter baseos foliorum perigonii parte superiore caulis sitæ, pedicellatæ, albæ, majusculæ.

A highly beautiful species and very different from any we have ever seen. The apices of the leaves are rather variable, in general they are bifid for ⅓ or ½ way down, with a rounded sinus; but, in other cases, the segments have more the appearance of subulate appendages placed on each of the rounded apices of the leaf; in one instance a trifid leaf was observed, the third segment was on the upper margin towards the base.

PLATE LXV. *Fig.* I.—I, a specimen of the *natural size*; 2 and 3, leaves; 4, stipule; *magnified.*

36. JUNGERMANNIA *allodonta,* Hook. fil. et Tayl.; caulibus implexis prostratis ramosis, foliis distichis imbricatis horizontaliter patentibus ovato-oblongis obtusis rotundatisve utrinque ad apicem bisetosis v. truncatis rarius acutis v. apiculatis, stipulis minutis lanceolatis bipartitis.

HAB. Lord Auckland's group; on the bark of trees in the woods.

Cæspites 1–2 unc. diametro, plani, appressi, luride virescentes. *Caules* sub 1 unc. longi, vage ramosi, prostrati, hic illic radicantes, una cum foliis sub 1 lin. lati. *Folia* tenera, laxe cellulosa, alterna, horizontaliter patentia,

ovato-oblonga v. subquadrata, basi lata decurrente, plerumque rotundata, apicem versus setis duabus subulatis divaricatis aucta, hinc quasi bicaudiculata, non raro autem truncata v. subemarginata, superiora interdum acuta v. apiculata. *Stipulæ* profunde bifidæ, sæpius in lacinias duas subulatas parallelas v. paulo divergentes partitæ, inconspicuæ.

37. JUNGERMANNIA *planiuscula*, Hook. fil. et Tayl.; laxe cæspitosa, caule procumbente ramoso, foliis membranaceis tenerrimis distichis laxe imbricatis patentibus ovato-rotundatis basi obliquis latioribus decurrentibus integerrimis, stipulis ovatis apice bifidis utrinque unidentatis rariusve integris. (TAB. LXV. Fig. II.)

HAB. Lord Auckland's group; on wet rocks near the sea, in the beds of streams, &c., forming large patches.

Cæspites majusculi, 3–4 unc. lati, fusco-purpurei, innovationibus pallide olivaceis. *Caules* nigricantes, sub 2 unc. longi, flaccidi, vage ramosi, procumbentes v. prostrati. *Folia* magnitudine varia, plerumque majuscula, 1½ lin. longa, laxe cellulosa, tenerrima, pellucida, apicibus rotundatis sæpe recurvis, marginibus interdum undulatis. *Stipulæ* bifidæ, segmentis subulatis erectis approximatis.

This exhibits much the habit and mode of growth of the last, but is a widely different and far larger plant; it is very variable in size, some of the shoots on the same branch having leaves not half the length of others.

PLATE LXV. *Fig.* II.—1, specimen of the *natural size*; 2, branch with stipule and leaf; 3, leaf; 4 and 5, stipules; *magnified.*

(9. CHEILOSCYPHUS, *Corda.*)

38. JUNGERMANNIA *australis*, Hook. fil. et Tayl.; cæspitosa, procumbens, caule ramoso, foliis imbricatis suberectis rotundatis basi superne sublobatis inferne decurrentibus, stipulis bipartitis varie sectis segmentis plerumque basi dentatis, fructu in ramis brevibus terminali, calyce oblongo curvato subcompresso bialato bilabiato labiis rotundatis obscure crenatis. (TAB. LXV. Fig. III.)

HAB. Lord Auckland's group and Campbell's Island; moist banks in the woods and on trunks of trees.

Cæspites 2–3 unc. lati. *Caules* robusti, suberecti v. procumbentes, vage ramosi, nunc inter *Hepaticas* alias solitarii, sub 1 unc. longi, fusco-brunnei, sæpe per totam longitudinem radicantes. *Folia* inferiora subpatentia, superiora imbricata, erecta, appressa, oblongo-rotundata, apicibus rotundatis integerrimis, cellulis plerumque majusculis opacis. *Stipulæ* forma variæ, plerumque oblongæ et bifidæ, utrinque basi unidentatæ, segmentis divaricatis acuminatis, rarius subquadratæ, quadrifidæ, v. quadridentatæ. *Calyx* exsertus, paulo curvatus, oblongus, basi cylindraceus, superne compressus, bialatus, alis subundulatis, ore obliquo bilabiato, labiis divergentibus obscure crenulatis.

The fertile branches of this plant are short, with about five pairs of leaves, of which the upper, or perichætial, are oblong, and the corresponding stipule is the largest and most deeply laciniated. A broken capsule, found within the calyx, contained rounded angular seeds and slender much-twisted spiral filaments, each formed of a double helix. The barren plant strongly resembles some states of *J. polyanthos*, L., but in the fertile plant the oblong winged calyx, the included calyptra, and the more divided and toothed stipules abundantly distinguish it.

PLATE LXV. *Fig.* III.—1, specimen of the *natural size*; 2, branch and calyx; 3, leaves and stipule; 4 and 5, stipules: *magnified.*

39. JUNGERMANNIA *Billardieri*, Schwæg. *Musc. Hepat. Prodr.* p. 19. *Hook. Musc. Exot.* t. 61. Cheiloscyphus, *Corda, Nees et auctorum.*

HAB. Lord Auckland's group and Campbell's Island; abundant in the woods and in marshes on the hills.

40. JUNGERMANNIA *coalita*, Hook.; *Musc. Exot.* t. 123. Cheiloscyphus, *auctorum*.

HAB. Lord Auckland's group; on the trunks of dead trees, &c., in the woods.

41. JUNGERMANNIA *sinuosa*, Hook.; *Musc. Exot.* t. 113. Cheiloscyphus, *auctorum*.

HAB. Lord Auckland's group; at the roots of trees, growing mixed with mosses.

Our specimens are quite white, the leaves, and especially the stipules, broader than in the figure quoted above; the latter reniform, with shorter laciniæ.

42. JUNGERMANNIA *leucophylla*, Hook. fil. et Tayl.; laxe cæspitosa, caulibus erectis elongatis subramosis gracilibus, foliis arcte imbricatis patentibus membranaceis convexis subtriangularibus una cum stipulis coalitis marginibus recurvis, ciliato-dentatis, stipulis oblongis erectis marginibus recurvis eroso-dentatis, calyce elongato oblongo compresso bilabiato labiis denticulatis, perigonii foliis confertis abbreviatis. (TAB. LXV. Fig. IV.)

HAB. Lord Auckland's group; on the ground in the woods, generally mixed with other species.

Caules laxe cæspitosi, dispersi, flavo-fusci v. pallide brunnei, tenues, curvati, vage ramosi, vix 1 unc. lati, cum foliis stipulisque subtrigoni. *Folia* una cum *stipulis* in laminam triangularem horizontaliter patentem perfoliatam omnino coalita, marginibus recurvis seu potius deflexis, substantia tenera pellucida laxe cellulosa. *Perigonia* terminalia v. lateralia, ramis angustiora, conspicua, foliis brevioribus quam folia caulina magisque confertis. *Antheræ* 3–4, pedicellatæ, minimæ.

A well marked and beautiful species.

PLATE LXV. *Fig.* IV.—1, a specimen of the *natural size*; 2, front, 3, back, and 4, side view of a branch; *magnified*.

43. JUNGERMANNIA *fissistipa*, Hook. fil. et Tayl.; caule prostrato subramoso, foliis distichis oblique patentibus densis arcte imbricatis ovatis obtusis apices versus grosse dentatis, marginibus decurvis inferiore integerrimo basi decurrente, superiore cum stipula rotundata fimbriato-lacera coalito. Cheiloscyphus fissistipus, *Gottsche, Lehm. et Lind. Spec. Hepat.* (ined.)

HAB. Lord Auckland's group; on the dead and decaying trunks of trees, in the woods.

This beautiful and strongly scented species is a near ally of *J. coalita*, Hook.; but in that the leaves are simply bifid at the apex, in this they are toothed repeatedly, and the stipules are much more divided, besides being generally distinctly bifid at the apex owing to the terminal pair of teeth being more remote than the others.

(10. LEPIDOZEA, *Dumort.*)

44. JUNGERMANNIA *lævifolia*, Hook. fil. et Tayl.; cæspitosa, implexa, caule elongato pinnato, ramis breviusculis patentibus attenuatis recurvis, foliis stipulisque quadrato-rotundatis quadrifidis rarius tri-quinquefidis segmentis acutis incurvis, calyce in ramis inferioribus abbreviatis terminali lanceolato acuminato sub orem denticulatum plicato.

HAB. Lord Auckland's group and Campbell's Island; at the roots of trees, &c., abundant.

Cæspites plani, appressi, subdensi, dilute flavo-brunnei v. olivacei. *Caules* graciles, 1–2 unc. longi, ramis divaricatis. *Folia* horizontaliter patentia, caule oblique inserta, remota, lævia, pallida, pellucida. *Stipulæ* $\frac{1}{4}$ magnitudinis folii. *Perichætium* perbreve, e foliis paucis erectis appressis quam foliis caulinis minus profunde sectis. *Capsula* cylindracea; *semina* numerosa, luride-brunnea, globosa; *fila* spiraliter torta, elongata, helice duplici.

This and the following may be considered representatives of the British *J. reptans*, L., to which the present is very nearly allied, though differing in the much smaller size, the less pinnated stems, the more distant leaves which have not the singularly prominent cells of the northern plant, and especially in the short perichætium and elongated calyx. It is also a native of New Zealand, in the Flora of which country it will be figured.

45. JUNGERMANNIA *patentissima*, Hook. fil. et Tayl.; subcæspitosa, caule valido repente pinnatim ramoso, ramis brevibus, foliis plus minusve imbricatis patentibus v. incurvis cellulosis latissime obovato-quadratis basi angustatis tri-quadrifidis segmentis integerrimis obtusis rectis v. incurvis, stipulis brevibus subquadratis transverse elongatis tri-quadridentatis. (TAB. LXV. Fig. V.)

HAB. Lord Auckland's group; creeping among tufts of other *Hepaticæ*, on trunks of trees, &c.

Caules inter *Hepaticas* alias *Muscosque* dispersi, pallide flavo-olivacei, breviusculi, vix $\frac{1}{4}$ unc. longi, validi, crassiusculi, cellulosi; ramis plerumque inconspicuis, brevibus, alternis, versus apices attenuatis. *Folia* caulina plerumque conferta, patentia (sed oblique, non horizontalia), subquadrata, plus minusve obovata, basi angustata v. subcuneata, segmentis incurvis v. planis, obovatis, 3–5-fidis, sæpius 4-fidis, cellulis majusculis. *Stipulæ* caule vix latiores, segmentis brevibus.

This plant approaches nearer to the *J. reptans*, L., than the former; it is, however, very much smaller, the leaves more closely imbricated, generally more deeply divided and narrower at the base.

PLATE LXV. *Fig.* V.—1, specimen of the *natural size*; 2, portion of branch; 3 and 4, leaves; 5 and 6, stipules; *magnified.*

46. JUNGERMANNIA *tenax*, Greville, *in Annals of Lyceum of New York*, vol. i. p. 277. pl. 23.

HAB. Lord Auckland's group; on the dry trunks of trees and on the ground.

A curious little species, first described by Dr. Greville, who gives an excellent figure of it, from New Holland specimens.

47. JUNGERMANNIA *tetradactyla*, Hook. fil. et Tayl.; cæspitosa, implexa, caule debili prostrato subpinnatim ramoso, foliis subremotis distichis patentibus basi quadratis quadrispinosis spinis articulatis, stipulis minimis quadripartitis, calyce elongato cylindraceo ore contracto ciliato.

HAB. Lord Auckland's group; creeping over patches of *J. coalita.*

Cæspites 1–2 unc. lati, pallide flavo-virides. *Caules* interdum 1 unc. longi, innovationibus plurimis ramosi; cellulæ externæ latæ, pellucidæ, albæ, centrales virides, opacæ, hinc caulis sub lente quasi ala membranacea cinctus appareat. *Folia* caulina remota, ramulina (plerumque superiora) conferta, basi angusta, deinde latiora, in spinas elongatas desinentia. *Stipulæ* caule vix latiores, segmentis subulatis.

Closely allied to the *J. centipes*, nobis, of Tasmania, from which it may be distinguished by the (transparent) more branched and pinnate stems, the more distant and patent transparent leaves, which are more deeply divided, with the segments elongated and setaceous: the two species are very near in other respects.

From New Zealand we have this plant with calyces and perigonia; the former are remarkably large in proportion to the size of the plant, being as long as the shoots which bear them, they are ovato-cylindrical and slightly bent on one side. The perichætial leaves are erect, with a longer entire portion or base than the cauline. Perigonia forming cylindrical spikes, their leaves large, bifid above with tumid bases, each containing in its axilla a single minute, round, brown, pedicellated anther.

48. JUNGERMANNIA *dispar*, Mont.; caulibus elongatis cæspitosis ramosis, foliis laxe imbricatis rarius in ramulis terminalibus imbricatis patenti-incurvis obovato-cuneatis basi angustatis ad medium trifidis seg-

mentis lineari-subulatis subacutis, stipulis minoribus conformibus, perigoniis terminalibus capitatis pro planta majusculis.—an J. hippurioides varietas? *J. dispar*, Montague *in Voy. au Pole Sud, Bot. Cryptog.* (ined.)

HAB. Lord Auckland's group and Campbell's Island; on the ground.

49. JUNGERMANNIA *hippurioides*, Hook. fil. et Tayl.; minima, laxe cæspitosa, caule procumbente ramoso, foliis subimbricatis patentibus obovatis bi-trifidis basi angustis, segmentis linearibus subacutis, stipulis minutis valde inconspicuis erectis appressis trifidis. (TAB. LXV. Fig. VII.)

HAB. Lord Auckland's group; on decayed bark, and at the roots of grasses and ferns in wet places.

Cæspites per innovationibus vagis intertexti, pallide olivacei. *Caules* vix unciales, irregulariter pinnati, una cum foliis densis crassiusculi. *Folia* conferta, imbricata, patentia, quasi verticillata, profunde bi-trifida rarius quadrifida, laciniis cellulosis inarticulatis. *Stipulæ* valde inconspicuæ, cauli latiori arcte appressæ, plerumque in segmenta tria divisæ.

A very distinct little species, though not easily characterized; the figure will give the best idea of its habit and peculiarities. It is most nearly allied to the *J. tetradactyla*, nobis, (vid. ante) from which it may be recognized by its shorter and more patent leaves, which, as well as the stipules, are usually trifid.

PLATE LXV. *Fig.* VII.—1, specimen of the *natural size*; 2, portion of branch; 3, stipules; *magnified.*

50. JUNGERMANNIA *albula*, Hook. fil. et Tayl.; majuscula, caulibus subimplexis erectis ramosis, foliis dense et arcte imbricatis erecto-patentibus concavis late et oblique ovato-rotundatis fimbriato-laceris laciniis plerisque profunde bifidis, stipulis concavis majusculis rotundatis sex- ad decemfidis laciniis bifidis. (TAB. LXV. Fig. VI.)

HAB. Lord Auckland's group; creeping through tufts of *Gottschea Lehmanniana.*

Caules vage dispersi, pallide albido-virescentes, subpinnatim v. dichotome ramosi, ½–1 unc. longi, sub ½ lin. lati, ramis breviusculis sæpe dichotomis, innovationibus flagelliformibus interdum instructis. *Folia* latissima, concava, basi semi-amplexicaulia, dense imbricata, sese amplectentia, laxe cellulosa, membranacea, pellucida, margine anteriore basin versus dentata, cæterum in lacinias curvatas bifidas partita. *Stipulæ* ⅓ magnitudine folii, imbricatæ, conspicuæ, marginibus laciniatis.

This is a very beautiful plant, much larger and of a different aspect from any of the former.

PLATE LXV. *Fig.* VI.—1, a specimen of the *natural size*; 2, lower, and 3, upper view of a portion of a branch; 4, leaf; 5, stipule:—*magnified.*

(11. MASTIGOBRYUM, *Nees.*)

51. JUNGERMANNIA *Novæ Hollandiæ*, Nees; caule prostrato ramoso subtus flagellifero divaricatim ramoso, ramis patentibus plerisque recurvis, foliis arcte imbricatis oblongo-acinaciformibus curvatis concavis abrupte truncatis apice eroso bi-tridentato stipulis caule latioribus reniformi-rotundatis marginibus recurvis dentatis v. multifidis.

HAB. Lord Auckland's group; common in the woods, creeping amongst mosses and other *Hepaticæ.*

52. JUNGERMANNIA *involuta*; Herpetium involutum, *Mont. in Voy. au Pole Sud, Bot. Crypt.* t. 18. fig. 2. *et in Ann. Sc. Nat.* 1843. p. 253.

HAB. Lord Auckland's group; common in the woods, forming large tufts.

A very handsome species, variable in size; of a much larger and more erect habit, and with broader leaves than the *J. Novæ Hollandiæ*, the latter have larger cells also.

53. JUNGERMANNIA *atro-virens*, Hook. fil. et Tayl.; caule gracili erecto disperso ramoso subtus flagellifero, foliis parvis patentibus subdistantibus triangulari-rotundatis apice inæqualiter bifidis segmentis acutis integerrimis, cellulis parvis punctiformibus marginem versus inferiorem majoribus, stipulis minutis transversis semi-rotundatis tripartitis segmentis acutis.

HAB. Lord Auckland's group; creeping through tufts of *Dicrana* and other mosses, in the woods and on the hills, not uncommon.

Caules 1–2 unciales, graciles, sæpe solitarii, vage ramosi, rigidi, erecti, interdum subflexuosi, crassiusculi, olivaceo-brunnei. *Folia* pro magnitudine caulis parva, vix imbricata, verticaliter patentia, oblique ovato-rotundata v. subtriangularia, bifida v. bidentata, segmento inferiore majore, apicibus plerumque incurvis, pallide brunnea v. flavo-fusca, subopaca, densa; cellulis manifeste punctiformibus. *Stipulæ* tridentatæ, dentibus acutis v. obtusis.

A very distinct species, which can scarcely be confounded with any other, of a wiry habit though particularly graceful and slender; this character, together with the great disproportion between the breadth of the leaves and stem, and the unequal cellules which are so large towards the inferior margin as almost to resemble a nerve, will readily distinguish it from any other. A similar disposition of the cellules is seen in *M. inæquilaterum*, Nees.

54. JUNGERMANNIA *nutans*, Hook. fil. et Tayl.; caulibus crassiusculis cæspitosis subsimplicibus erectis incurvis apicibus sæpe nutantibus, foliis densis arcte imbricatis patentibus valde concavis late ovatis apice inæqualiter bifidis margine subintegris carnosiusculis laxe cellulosis, stipulis erectis late ovato-rotundatis apice bifidis v. subdentatis, stolonibus subbasilaribus ascendentibus ad apices demum foliosis. (TAB. LXV. Fig. VIII.)

HAB. Lord Auckland's group; in moist places on the ground, and at the roots of trees.

Caules cæspitosi, simplices, erecti, incurvi v. nutantes, ut in *J. tenaci*, Grev., crassiusculi, carnosuli, cellulosi, albidi v. pallide virescentes, ad apices siccitate sæpe nigricantes, subunciales. *Folia* valde concava, bifida, segmento inferiore minore, cellulis sæpe margines versus prominulis aquosis, ad medium folii majoribus.

Very unlike any of the other species of this genus, though in some respects approaching the *J. tenax*, Grev., in which the stems are branched and the leaves multifid. The whole plant is of a singularly flaccid or flabby consistence, formed of watery or fleshy cells, a good deal similar to those of *J. notophylla*, nobis (vid. ante).

PLATE LXV. *Fig.* VIII.—1, specimen of the *natural size*; 2, portion of branch; 3, stipule:—*magnified.*

(12. SCHISMA, *Dumort.*)

55. JUNGERMANNIA *Scolopendra*, Hook.; *Musc. Exot.* t. 40. Schisma Scolopendra, *Nees et auct.*

HAB. Lord Auckland's group and Campbell's Island; on the hills, abundant; often resembling a *Racomitrium* in its habit of growth.

(13. MASTIGOPHORA, *Nees.*)

56. JUNGERMANNIA *hirsuta*, Nees.

HAB. Campbell's Island.

This we have compared and found to agree with authentic specimens of *J. hirsuta*, Nees, but we are not aware where that species is published.

(14. TRICHOCOLEA, *Nees.*)

57. JUNGERMANNIA *mollissima*, Hook. fil. et Tayl.; laxe cæspitosa, implexa, caule ascendente bipinnatim ramosissimo, foliis confertis alternis patentibus e basi lata dichotoma multifidis laciniis capillaribus sti-

pulis bifidis dichotome laciniatis, calyce ex parte inferiore caulis obovato clavato bilabiato undique squamis lineari-lanceolatis laciniatis tecto.

HAB. Lord Auckland's group and Campbell's Island; abundant on moist rocks on the hills, on trunks of trees in the woods, &c.

Cæspites plani, molles, albidi, juniores pallide virides. *Caules* 4–6 unc. longi et ultra, teretes; rami divaricati, conferti, per totam longitudinem caulis subæquilongi, hinc caulis subpectinatus. *Folia* basi patentia, sursum erecta, apicibus incurvis. *Stipulæ* foliis conformes sed minores. *Calyx* sub 2 lin. longus, lateralis; *pedicello* fere ½ unc. longo; *capsula* oblonga.

This very beautiful plant is nearly allied to *J. tomentella*, Ehr., from which it differs in the more procumbent or prostrate mode of growth, in the more crowded cylindrical (not compressed) branches, in the stipules and leaves being broader at the base and dichotomously divided, and in the calyx bearing elongated linear-lanceolate scales. It is also a native of New Zealand.

58. JUNGERMANNIA *polyacantha*, Hook. fil. et Tayl.; caulibus subcæspitosis erectis ramosis spiculosis, foliis laxe imbricatis patentibus stipulisque basi angustis quadrifidis laciniis multifidis ramosis ultimis spiculæformibus articulatis, calyce terminali majore lineari-obovato superne tumido subquadridentato hispido. (TAB. LXV. Fig. IX.)

HAB. Lord Auckland's group; in woods near the sea.

Caules tenues, graciles, laxi, inter *Muscos Hepaticasque* alias dispersi, v. cæspitosi, pallide flavi, flaccidi, debiles, vix ½ unc. longi, parce ramosi, apicibus plerumque e foliis plurimis confertis incrassati, spiculis articulatis obsiti. *Folia* basi semiamplexicaulia. *Stipulæ* concavæ. *Calyx* vere terminalis, pro planta maximus, squamis foliaceis obovatis multifidis hispidus.

A very curious and distinct little species. The stems and branches have a peculiarly hispid and squarrose appearance, from the acicular scales and apices of the leaves which beset them and point in all directions. In some respects it resembles *J. tetradactyla*, nobis, and in others the *J. setacea* and *J. trichophylla*, from all of which it is abundantly distinguished by the compound segments of the leaves. From *J. tomentella*, its nearest ally, it differs in its much smaller size and different habit, in the rigid and fragile texture of its more deeply divided leaves, which appear hardly to possess any base or lamina, and in the crenate mouth of the calyx.

PLATE LXV. *Fig.* IX.—1, specimen of the *natural size*; 2, leaf; 3, calyx:—*magnified*.

(15. RADULA, *Dumort.*)

59. JUNGERMANNIA *complanata*, L.; *Syst. Nat.* vol. ii. p. 706. *Hook. Brit. Jungerm.* t. 81.

HAB. Campbell's Island; upon the bark of trees.

60. JUNGERMANNIA *physoloba*, Mont., caulibus cæspitosis prostratis subpinnatim ramosis, ramis complanatis, foliis suberectis imbricatis convexis integerrimis lobo superiore obovato-rotundato margine recurvo, perichætialibus oblongis transversis deflexis, calyce elongato obconico compresso truncato integerrimo. Radula physoloba, *Mont. in Voy. au Pole Sud, Bot. Crypt.* t. 17. fig. 4. *et in Ann. Sc. Nat.* 1844. p. 255. J. complanata, var. β, *Hook. Brit. Jungerm.* t. 81. f. 17. J. Aquilegia, *nobis, in Lond. Journ. of Botany*, vol. iii. p. 291.

HAB. Lord Auckland's group; growing mixed with mosses on wet rocks.

Cæspites lati, appressi, plani, olivaceo-brunnei. *Caules* 1–4 unc. longi, irregulariter pinnati, ramis divaricatis. *Folia* basi angusta, concava; lobo inferiore basi tumido, superiori obtuse angulato arcte appresso.

Found abundantly in Ireland, and according to Lindenberg in Switzerland; in the former locality, as in its southern habitat, preferring wet rocks. It may be distinguished from *J. complanata*, L., by its smaller size, more convex leaves, thin texture and brown colour, by the lesser lobe being tumid at the base and not sharply reflected on the larger or upper, and by the deflexed perichætial leaves; besides these characters we may remark that the perigonia are usually terminal and not upon lateral short branches, and that the angulate portion of the lower lobe is shorter than in *J. complanata*.

61. JUNGERMANNIA *uvifera*, Hook. fil. et Tayl.; caule implexo procumbente pinnatim ramoso, foliis imbricatis patentibus integerrimis, lobo superiore majore convexo late oblongo-rotundato apice recurvo basi rotundato, inferiore superne truncato v. rotundato ovato-oblongo obtuso inferne subtumido apice lobo superiori appresso, perigoniis lateralibus filiformibus sub foliis latentibus, calyce obovato-oblongo valde compresso subcochleariformi utrinque marginibus acutis subalatis lateribus basi ad medium 4–5 costatis, ore truncato integro.

HAB. Lord Auckland's group; on the bark of trees, &c., abundant.

Cæspites planiusculi v. tumidi, late extensi, olivaceo-brunnei, implexi. *Caules* 1–2 unc. longi, crassiusculi, valde ramosi, foliis convexis undique imbricati, apicem versus sæpe purpurascentes. *Folia* subrecurva, late obovato-rotundata; lobo superiore nunc deorsum in auriculam producto, nunc angustiore, lobo inferiore $\frac{1}{3}$ magnitudine superioris, superne eo arcte appresso inferne tumido, forma varia, substantia opaca læte sed pallide flavo-brunnea. *Innovationes* infra folia plurimi, breves, parvi, perigoniis sæpe alternantes. *Perigonia* omnino inter folia occlusa, minuta, filiformia, foliis 8–10 urceolatis arcte imbricata. *Perichætium* e foliis duobus erectis constans, apicibus latis rotundatis, lobo inferiore subinvoluto.

This species is closely allied to the *R. pectinata*, Nees, but the upper lobes of the leaves are more elongated and the lower are broad at the apex, the perigonia also are shorter. The calyx is here remarkable for the compressed margins being almost winged and the two sides furnished with several elevated costæ. The smaller lobe of the leaf is at first very tumid, more appressed when older.

(16. MADOTHECA, *Dumort.*)

62. JUNGERMANNIA *elegantula*. Madotheca elegantula, *Mont. in Voy. au Pole Sud, Bot. Crypt.* t. 18. f. 3. *et in Ann. Sc. Nat.* 1843. p. 255.

HAB. Lord Auckland's group; on trunks of trees in the woods.

Very closely allied to the European *J. platyphylla*, differing chiefly in the less decidedly pinnate ramification, in the more distant branches, in the frequent toothing of the lower lobe (not shown in Montagne's figure), and in the plane margins of the stipules, which are recurved only at the tips; the capsule also is split down to the very base into four valves. Montagne compares it with *M. subsquarrosa*, Nees and Mont., from Juan Fernandez.

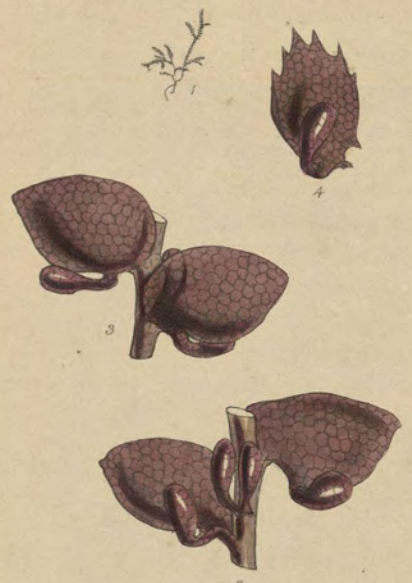
(17. FRULLANIA, *Nees.*)

63. JUNGERMANNIA *Magellanica*, Lamarck, *Encycl. Bot.* vol. iii. p. 28. *Hook. Musc. Exot.* t. 115.

HAB. Campbell's Island; on alpine rocks.

The foliage is paler in colour and more lax than in the specimens figured in the 'Musci Exotici.' It is also a native of Tasmania, from whence we have specimens with fully formed calyces.

I.



J. allophylla.

II.

J. reticulata.

III.

J. aterrima.

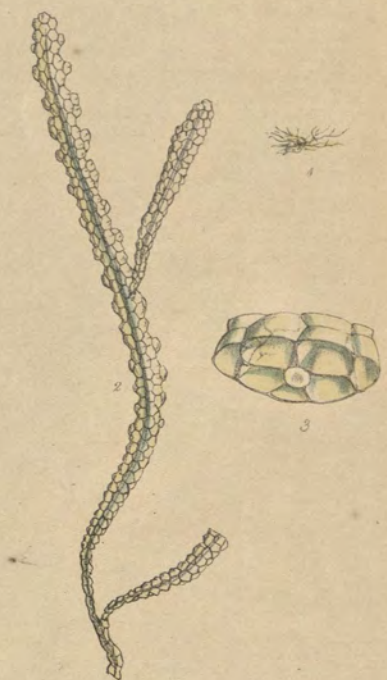
IV.

J. albovirens.

V.

J? cochleata.

VI.



J. argentea.

J.D.H & W.F.del.

Printed by Reeve Brothers.

64. JUNGERMANNIA *clavigera*, Hook., *Musc. Exot.* t. 70.

HAB. Campbell's Island; on rocks, and on the trunks of trees.

These specimens vary much in colour, in general they are of a richer brown, and less olivaceous than in the figure quoted, at other times they are nearly black.

65. JUNGERMANNIA *ptychantha*. Frullania ptychantha, *Mont. in Voy. au Pole Sud Bot. Crypt.* t. 19. f. 3. *et in Ann. Sc. Nat.* 1843. p. 257. J. Myosota, *nobis in Lond. Journ. of Bot.* v. 3. p. 393.

HAB. Lord Auckland's group and Campbell's Island; on the trunks of trees, and on rocks on the hills, abundant.

The perichætial leaves in this species are three, closely embracing the base of the calyx; the two lateral entire, obovate, having a strap-shaped acute curved inner lobe with reflexed sides; the third or stipular lobe is oblong, deeply divided into recurved linear segments, whose margins are uneven but not toothed. *Calyx* cylindrical and smooth for $\frac{1}{3}$ way up, then ovate-rotundate, exserted, laciniated; in the young state it appears terminated by a short tube.

This species may be known from all others by the minute, divergent auricles below the leaves, and more particularly by the plicate calyx. Montagne compares it with *F. gracilis, nodulosa* and *integristipula*, and adds that besides the difference in the calyx, the first of these has the involucral leaves serrated, and in the two others the stipules are entire.

66. JUNGERMANNIA *allophylla*, Hook. fil. et Tayl.; caulibus laxe dispersis flaccidis gracilibus flexuosis subramosis, foliis distantibus erecto-patentibus patulisve late ovatis obtusis acutisve integriusculis laxe reticulatis, auriculis anguste oblongo-pyriformibus clavatisve incurvis a folio divergentibus, stipulis minutis bifidis segmentis lanceolatis sæpius clavatis. (TAB. LXVI. Fig. I.)

HAB. Campbell's Island; on the hills, rare, growing with other *Jungermanniæ*.

Caules 2–3 lin. longi, parce ramosi; rami alterni, siccitate subatri, madore læte sanguineo-purpurei. *Folia* forma sat varia, inferiora longiora, late ovata v. elliptica, obtusa v. rarius acuminata, integerrima v. bi-tridentata, cellulis pro planta maximis, auriculis pedicellatis majusculis erectis interdum deflexis.

A beautiful little species and one of the smallest that is known of this subgenus; as in *J. clavigera* the lobes of the stipules are often replaced by club-shaped auricles.

PLATE LXVI. *Fig.* I.—1, a specimen of the *natural size*; 2 and 3, front and back view of leaves; *magnified*.

67. JUNGERMANNIA *rostrata*, Hook. fil. et Tayl.; caule exiguo repente subpinnatim ramoso, foliis subapproximatis patentibus rotundatis subapiculatis integerrimis lobo inferiore oblongo-lanceolato appendiculato, stipulis minutis rotundatis bifidis integerrimis, perigoniis obovatis rotundatis, perichætiis oblongo-rotundatis, calyce obovato apice tubuloso basi angusto lineari.

HAB. Lord Auckland's group; on *Parmelia enteromorpha*, Ach.

Cæspites 1–2 unc. lati, rufo-brunnei. *Caules* minuti, graciles. *Folia* rotundata, lobulo inferiore $\frac{1}{3}$ magnitudine superioris; *perichætialia* oblonga, apiculata, incurva, marginibus lobuli inferioris reflexis. *Calyx* perichætio bis longior.

The present species bears much general resemblance to *J. lobulata*, Hook., differing from it in the smaller size, the narrow base of the calyx, which is of a different and less trigonous form, being wider above, and in the acute or apiculate leaves of the perichætium. It is as small as the previous species.

68. JUNGERMANNIA *reticulata*, Hook. fil. et Tayl.; caulibus implexis prostratis subpinnatim ramosis,

ramis brevibus, foliis distichis imbricatis patentibus concavis late rotundatis apice recurvis superioribus late ovatis grosse dentatis, auriculis interdum nullis superioribus nunc bifidis segmento exteriore clavato interiore subulato, stipulis bi-quadripartitis. (Tab. LXVI. Fig. II.)

Hab. Lord Auckland's group; rocks on the mountains.

Cæspites 2–3 unc. lati, planiusculi, rupibus appressi, intertexti, nigrescentes, nunc pallidiores, innovationibus læte purpureis. *Caules* sub 2 unc. longi, interdum elongati, ramis plerumque brevibus. *Folia* tenerrima, valde pellucida, areolis majusculis, inferiora integerrima, sæpe lobulo intus aucta. *Stipulæ* concavæ, profunde partitæ, nonnullis v. omnibus clavatis.

This is a very beautiful microscopic object, and though allied to *J. clavigera* is very distinct from it. The lower leaves are sometimes nearly reniform, with no auricle whatever, but the most remarkable differential character lies in the very lax reticulation of its cells

Plate LXVI. *Fig.* II.—1, a specimen of the *natural size*; 2 and 3, leaves; 4, 5 and 6, stipules; *magnified.*

69. Jungermannia *aterrima*, Hook. fil. et Tayl.; pusilla, caule implexo procumbente vage ramoso, foliis imbricatis patentibus convexis rotundato-oblongis integerrimis marginibus recurvis, auriculis late oblongo-pyriformibus inflatis, stipulis minutis ovatis bipartitis segmentis lanceolatis basi extus unidentatis, perigoniis rotundatis, foliis perichætialibus integerrimis incurvis. (Tab. LXVI. Fig. III.)

Hab. Lord Auckland's group; on alpine rocks, mixed with *Andreæa* and other mosses.

Cæspites nigri, apicibus nitidis rarius purpurascentibus; ramis subsolitariis. *Folia* rotundata v. late et oblique ovata. *Stipulæ* bipartitæ, integræ v. utrinque dente majusculo extus aucto et hinc quadrifidæ. *Planta* plerumque monoica. *Perigonia* breviter pedunculata, arcte imbricata, rotundata, superne longitudinaliter sulcata, marginibus foliorum valde incurvis. *Perichætii* foliia tria, secunda, valde concava, corpora tria rotundata referentes.

This has some points of affinity with the *J. fragilifolia*, Tayl., a species lately observed in Ireland and Switzerland, which is equally minute but not so uniformly black and shining, and has the leaves less densely cellular, and the perichætial ones dentate.

Plate LXVI. *Fig.* III.—1, a specimen of the *natural size*; 2, 3 and 4, leaves; 5 and 6, stipules; 7, perichætial leaf; *magnified.*

70. Jungermannia *congesta*, Hook. fil. et Tayl.; cæspitosa, caule procumbente ramoso, foliis imbricatis patentibus integerrimis late ovatis rotundatisve subapiculatis, auricula inflata oblongo-pyriformi, stipulis minutis ovato-rotundatis bifidis integerrimis, foliis perichætialibus oblongis apiculatis integerrimis albidis.

Hab. Lord Auckland's group; on rocks and on the bark of trees.

Cæspites extensi, sub 2 unc. lati, pallide flavo-brunnei. *Caules* graciles, sub 2 unciales, pinnatim ramosi; ramis erecto-patentibus, sæpe ascendentibus v. sursum curvatis. *Folia* valde convexa, plerumque apiculata, auricula caule remota infra marginem folii extensa. *Stipulæ* integerrimæ, caule vix latiores, apicem versus bifidæ, segmentis acutis. *Folia* perichætialia erecta, integerrima, acuminata, duobus lateralibus oblongis lobulo inferiore margine inflexo, stipulari in segmenta duo lanceolata apiculata integerrima fissa.

Very similar to the *J. ptychantha*, Mont., but the whole plant much smaller, the auricles occupy a different position, and the perichætial leaves are of a different form. The barren perichætia which have rounded summits, are probably modified in the perfect plant. From *J. aterrima*, to which it is in some respects allied, it may be known by the larger size, pale colour, acute perichætial leaves, and, above all, by the entire stipules.

71. JUNGERMANNIA *scandens.* Frullania scandens, *Mont. in Voy. au Pole Sud, Bot. Crypt.* t. 19. f. 2. *et in Annal. des Sc. Nat.* 1843, p. 258.

HAB. Lord Auckland's group; on branches of trees (*MM. Hombron et Jacquinot*).

This species was not found during the stay of the Antarctic Expedition in Lord Auckland's group. Montagne compares it with *F. hians, ornithocephala,* and *obscura,* Nees.

(18. LEJEUNIA, *Lib.*)

72. JUNGERMANNIA *implexicaulis,* Hook. fil. et Tayl.; caulibus cæspitosis suberectis ramosis, foliis laxe imbricatis suberectis patentibus valde concavis ovatis obtusis apicibus marginibusque incurvis areolis punctiformibus, lobulis anguste ovatis tumidis inflexis, stipulis rotundatis caule latioribus apice fissis segmentis suberectis.

HAB. Campbell's Island; creeping through tufts of mosses in rocky places.

Caules ½–1 unc. longi, inter muscos dispersi v. *cæspites* plus minusve confertos formantes, olivaceo-virides, vage ramosi, ramis erectis. *Folia* valde concava, hinc oculo nudo rami moniliformes apparent, subdecurrentia, lobulo cauli proximo, areolis minimis punctiformibus. *Stipulæ* fere orbiculares, primo visu integræ, sed fissæ segmentis approximatis v. imbricatis.

Very nearly allied to the *J. serpyllifolia,* Dicks.; it has, however, a different aspect, owing to the erect leaves, which are not plane but very concave, and instead of being loosely cellular are formed of a very compact tissue, the cells of which require a high power to be distinguished, the leaves themselves also are twisted forwards and not patent. The stipules appear undivided, except when the segments are forced asunder; whilst in *J. serpyllifolia* they diverge and often have a very rounded sinus between them.

73. JUNGERMANNIA *Mimosa,* Hook. fil. et Tayl.; caulibus implexis repentibus ramosis, foliis imbricatis patentibus concavis oblique obovato-oblongis subcurvatis v. acinaciformibus apicibus patentibus recurvis integerrimis, lobulis ovatis involutis, stipulis late ovatis acute bifidis, calyce late elliptico-ovato pentagono ore contracto subtubuloso.

HAB. Lord Auckland's group; on moist alpine rocks.

Cæspites parvi, fusco-olivacei. *Caules* sub ½ unc. longi, irregulariter vage ramosi, ascendentes. *Folia* subincurva, ut in *J. serpyllifolia,* sed præsertim apices versus latiora et ad latus curvata, hinc subacinaciformia, lobulo erecto-patente; substantia crassiuscula, areolis parvis. *Stipulæ* caule vix latiores, apice fissæ, segmentis subdistantibus erectis, sinu obtuso. *Folia perichætialia* late oblongo-rotundata, integra, concava, apicibus recurvis, tertio stipulæ conformi sed magis concavo. *Perigonia* lateralia, spicata; foliis arcte imbricatis, brevibus, rotundatis, tumidis. *Calyx* basi angustatus, obovatus v. obovato-ellipticus, pentagonus v. sub 5-alatus, ore minuto tubuloso.

The chief points of distinction between this and the *J. serpyllifolia,* Dicks., reside in the denser structure of the leaves, their tops being recurved; the larger calyx, which tapers towards the narrower base, and the rounder more concave perichætial leaves. From *J. implexicaulis* it may be known by the more cellular and planer leaves, their very different direction, and the remote segments of the stipules.

74. JUNGERMANNIA *primordialis,* Hook. fil. et Tayl.; caulibus exilibus implexis vage ramosis, ramis subpatentibus, foliis laxis suberectis anguste obovatis apicibus rotundatis concavis integerrimis lobo inferiore ovato involuto, stipulis minimis emarginato-bifidis segmentis linearibus subobtusis divaricatis.

HAB. Lord Auckland's group; on a species of *Sticta* in the woods.

Cæspites parvi, pallide olivaceo-virides. *Caules* sub ¼ unc. longi, ramis divaricatis. *Folia* remota, suberecta, anguste obovata, lobo inferiore extus ad inflexionem dente obtuso aucto.

The minute size, more erect, narrow and more distant leaves, will readily distinguish this species from small states of *J. serpyllifolia*, even in the absence of fructification.

75. JUNGERMANNIA *albo-virens*, Hook. fil. et Tayl.; minima, caulibus implexis prostratis ramosis, foliis laxis patentibus valde concavis oblongis apice rotundatis integerrimis, lobulis involutis ovatis tumidis, stipulis exiguis oblongis bifidis segmentis obtusis acutisve, calyce in ramo brevi proprio terminali obovato-elongato basi angustato apice quadriplicato tubuloso. (TAB. LXVI. Fig. IV.)

HAB. Lord Auckland's group; on rocks at the summits of the mountains, mixed with other *Jungermanniæ*.

Laxe cellulosa. *Caules* per plantas alias dispersi, non cæspitosi, pallide flavo-olivacei, 2–3 lin. longi, siccitate fragiles, irregulariter ramosi, ramis remotis. *Folia* basi semiamplexicaulia et subsaccata, superne oblonga et rotundata, apicibus plerumque recurvis, cellulis majusculis aquosis. *Stipulæ* cauli arcte appressæ, inconspicuæ, oblongæ, caule vix latiores. *Perichætii foliola* tria, lateralibus erectis concavis obtusis lobulo acuto intus auctis, tertio v stipulari oblongo bifido stipulis omnino conformi sed majore. *Calyx* apice tubulosus, demum in lacinias quatuor dehiscens. *Capsula* spherica, pallide brunnea, valvis basi coadunatis. *Semina* majuscula, pauca, angulata; filis spiralibus paucis, diametro ⅓ seminum.

Very nearly allied to the *J. ulicina*, Tayl. (*J. minutissima*, Brit. Jung.), preferring also wet mosses on which to grow. The British plant may be distinguished by its smaller size, the larger cells of the leaves, which are not so concave and subacute, whilst their lobulus has a sharp process or tooth at the point of involution, also by the more divided stipules, whose segments are acuter, and by the recurved perichætial leaves.

PLATE LXVI. *Fig.* IV.—a specimen of the *natural size*; 2, portion of branch; 3, leaf, and 4, stipule: *magnified.*

76. JUNGERMANNIA *latitans*, Hook. fil. et Tayl.; minima, caule tenuissimo prostrato ramoso, foliis remotiusculis suberectis celluloso-crenulatis ovatis acutis apicibus sæpe incurvis, lobulis ovatis involutis, stipulis inconspicuis bifidis segmentis lanceolatis obtusis, foliis perichætialibus late obovato-cuneatis acuminatis.

HAB. Lord Auckland's group; mixed with other *Hepaticæ*.

Cellulosa, minima. *Cæspites* laxi, dispersi, planiusculi, pallide virescentes. *Folia* remotiuscula, longitudine varia, acuta v. acuminata, cellulis præcipue versus margines majusculis tumidis et prominentibus, hinc folia subcrenata, lobulo ½ latitudine folii. *Stipulæ* valde inconspicuæ, caule vix latiores. *Perichætii foliola* ramis anni præcedentis terminalia, erecta, obovata, acuminata, lateralia incurva, tertio oblongo concavo bifido.

Closely resembling the *J. hamatifolia*, Hook.; but the leaves are much broader. From *J. echinata*, Tayl., it may be known by the presence of stipules; from *J. albo-virens*, by its smaller size, more cellular texture, and acute leaves.

77. JUNGERMANNIA *plicatiloba*, Hook. fil. et Tayl.; caulibus implexis procumbentibus vage ramosis, foliis laxis erecto-patentibus valde concavis rotundato-quadratis subtruncatis integerrimis, lobo inferiore incurvo apice angulato superiori subæquali basi tumido appresso, stipulis exiguis emarginato-bifidis segmentis linearibus subincurvis.

HAB. Lord Auckland's group; on *Parmelia intestiniformis*, Ach.

Cæspites minuti, laxi, pallidi. *Caules* vix ¼ unc. longi. *Folia* remota. *Stipulæ* minimæ.

The shoots of this species appear like rows of the minutest beads, so small is the whole plant, and the stem is all but imperceptible, even with a tolerable lens. The position of the lobe on the lower part of the leaf resembles that of a *Radula*.

(19. SYMPHIOGYNA, *Nees.*)

78. JUNGERMANNIA *Phyllanthus*, Hook., *Musc. Exot.* t. 95.

HAB. Lord Auckland's group; in the shaded woods, abundant but barren.

79. JUNGERMANNIA *flabellata*, Lab., *Fl. Nov. Holl.* vol. ii. p. 109. t. 254. f. 1. *Hook. Musc. Exot.* t. 13.

HAB. Lord Auckland's group; with the former, but also barren.

(20. ANEURA, *Nees.*)

80. JUNGERMANNIA *multifida*, L. *Hook. Brit. Jungerm.* t. 45.

Var. β, *incisa*; frondibus atro-viridibus carnosis inciso-ramosis, lobis pinnatis apice bilobis subdecurvis. J. incisa, nobis, in *Hook. Lond. Journ. of Bot.* vol. iv. p. 93.

Var.? γ, *minima*; cæspitosa, frondibus vix $\frac{1}{4}$ lin. latis.

HAB. Lord Auckland's group and Campbell's Island; var. β, in the former locality only; var. γ, Lord Auckland's group. (*Dr. Lyall.*)

Of this widely diffused and highly variable plant we have noticed what appear to be the most striking varieties; all of them are destitute of any trace of fructification, and some may be improperly included under this species, or even genus; there are, however, no grounds for removing them from *Aneura*, and being anxious to draw attention in this work to all that is known of the Flora of the South, we prefer arranging such dubious plants with their nearest apparent allies, to passing them by unrecorded.

(21. METZGERIA, *Nees.*)

81. JUNGERMANNIA *furcata*, L. *Hook. Brit. Jung.* t. 55. and 56.

Var. γ, *æruginosa*, *Brit. Jungerm.* l.c.

HAB. Lord Auckland's group and Campbell's Island; very abundant at the roots of ferns and other plants; var. γ, on the bark of trees.

This plant is as variable in size in this part of the world as in others.

(22. ZOOPSIS, *Hook. fil. et Tayl.*)

Perichætium e squamis paucis lanceolatis. *Calyx* e frondis nervo ortus, pedicellatus, obovato-oblongus, in lacinias plurimas fissus.—Frondes *lineares, parce ramosæ, e cellulis hexagonis pro magnitudine plantæ majusculis tumidis formatæ, nervo centrali valido, marginibus crenatis interdum sinuato-repandis.* Calyx *maximus.*—Planta anomala a *Diplolæna*, Nees, differt calyce simplici, hinc, scilicet extrorsum, squamis perichætialibus prædito.

82. JUNGERMANNIA *argentea*, Hook. fil. et Tayl.; *Hook. Lond. Journ. of Botany*, vol. iii. p. 400. *sub* Metzgeria. (TAB. LXVI. Fig. VI.)

Hab. Lord Auckland's group; at the roots of trees, ferns, &c., growing amongst other *Hepaticæ* and mosses.

Cæspites parvi, procumbentes, argentei, inter muscos dispersi. *Frondes* rigidiusculæ, 2–3 lin. longæ, simpliciusculæ, gracillimæ, compressæ v. complanatæ, e cellulis majusculis hexagonis nervum validum includentibus formatæ, marginibus e cellulis irregulariter prominentibus sinuato-repandis, rarius hinc inde in lobos expansis, nervo centrali viridi valido. *Rami* pauci, patentes, simplices v. rarius furcati. *Calyces* pro magnitudine plantæ maximi, e nervo centrali ipso orti, breviter pedicellati, urceolati v. campanulati, laxe cellulosi, in lacinias plurimas magis articulatas minusve profunde fissi, basi squamis paucis (perichætio) muniti.

A very singular plant, closely allied to none in the Order *Hepaticæ*; it forms pale silvery patches at the roots of ferns, &c., in the woods, but has only been found fruiting in New Zealand, where, as in Tasmania also, it is probably abundant. In the specimens from Lord Auckland's group the fronds are hardly sinuated at the margins and often formed of only one or two series of cells surrounding the axis; in those from more Northern Latitudes other series of cells are superadded, the fronds are more compressed, and their margins so sinuated from the irregularly placed cells as to resemble the rudiments of leaves. Though the walls of the cells are exceedingly delicate, the whole plant is of a rigid texture, and very slowly recovers itself when moistened; this somewhat horny consistency of the frond, resembling some *Sertulariæ*, has suggested to us the generic name. The drawing was made before the fructification was observed, by Mr. Wilson, upon the New Zealand specimens.

Plate LXVI. *Fig.* VI.—1, a small tuft of the *natural size*; 2, a frond; 3, a section of the same, very highly *magnified*.

2. HYGROPILA, *Tayl.*

1. Hygropila *dilatata*, Hook. fil. et Tayl. in *Hook. Lond. Journ. of Bot.* vol. iii. p. 576.

Hab. Lord Auckland's group; on the ground in damp woods.

This is one of the numerous frondose *Hepaticæ* which cover the ground so abundantly in the humid regions of the South; they evidently belong to many species, but having never been found in fructification, it is exceedingly difficult to distinguish the species by the form and texture of their variable fronds, and still more to determine the genera to which they belong. The present, of which our specimens are but imperfect, seems identical with a very common New Zealand plant, which abounds in moist places, and especially near cataracts.

3. MARCHANTIA, *March.*

1. Marchantia *polymorpha*, L.

Hab. Lord Auckland's group and Campbell's Island; abundant.

A plant universally distributed throughout the Southern Hemisphere.

4. ANTHOCEROS, *Michel.*

1. Anthoceros *punctatus*, L.?

Hab. Campbell's Island; on the wet ground.

We are not assured of the identity of this plant with the Europæan *A. punctatus*, L., the specimens being very imperfect.

Dubii generis.

Riccia? *cochleata*, Hook. fil. et Tayl., in *Hook. Lond. Journ. of Bot.* vol. iv. p. 96. (Tab. LVI. Fig. V.)

HAB. Lord Auckland's group; growing in dense tufts of mosses and *Hepaticæ*, on exposed rocks towards the hill tops.

Frondes laxe cæspitosæ, vix $\frac{1}{2}$ unc. longæ, $\frac{1}{10}$ crassitudine, olivaceæ, ascendentes, lineari-oblongæ, crassæ, concavæ, hinc inde lobatæ, apicibus procumbentibus bilobis, lobis rotundatis integerrimis conniventibus, marginibus integris incurvis. *Substantia* carnosa, intus spongiosa, laxe cellulosa.

This being quite unlike any of the hitherto described *Hepaticæ*, we attached the generic name of *Riccia* from a certain resemblance in the form of its frond to several species of that genus, but the plant is more probably allied to some frondose *Jungermannia*,—*J. epiphylla* for instance. The concave frond with entire connivent lobes, partakes of the habit of that of *Collema granulatum*, Ach., but our plant is certainly a Hepatica.

PLATE LXVI. *Fig.* V.—1, a specimen of the *natural size*; 2, a frond, and 3, a section of the same; *magnified.*

XXXV. FUNGI, *L.*

(By the Rev. M. J. BERKELEY.)

The number of *Fungi* collected during the Expedition is very small, in proportion to that of other cryptogamic plants, with the exception of those found in New Zealand and Van Diemen's Land. In the more southern localities, *Fungi* may naturally be expected to cease, sooner than *Algæ*, *Lichens*, and *Mosses*; and accordingly, from such localities, the amount of species is trifling indeed. Even where the degree of cold is not sufficient to prevent the growth of *Fungi*, their fructification is materially affected; and thus, in the higher forms, the hymenium will frequently be found barren; while, in some hypogæous species, transformations of the sporophores themselves take place, causing the fructifying mass to assume a very anomalous appearance. Some species indeed, as *Pilobolus crystallinus* and *Hydrophora stercorea*, seem to flourish most in the frosty nights of autumn, and the species of the genus *Chætonypha* and *Lanosa nivalis* thrive either beneath or upon the surface of the snow; but I know of no other exceptions to the more general habit of these species, and in these cases, the temperature either does not descend below the freezing point, or, as in the case of the *Chætonypha*, vegetation takes place only when the surface of the snow is just melting under the influence of the sun.

Amongst the more northern islands visited by the Expedition it is probable that some interesting forms, had time allowed, would have rewarded further research; though, indeed, constant attention was directed, even to the obscurest forms of vegetation, wherever circumstances would permit. As it is, there is a considerable number of new species to describe, and some of them possess much interest, especially a new *Cyttaria* from Cape Horn, the specimens of which are so numerous as to afford an excellent opportunity of examining the structure of this curious genus; which, like *Podisoma* and *Gymnosporangium*, which infest certain species of Juniper, developes itself on the living branchlets of the deciduous-leaved Beech. Some of the species, like those of other Cryptogams, are identical with plants of the Northern Hemisphere; and this is especially observable in New Zealand, where the identity is not confined to those families in which it is more usual.

1. AGARICUS, *L.*

1. AGARICUS *pyxidatus*, Bulliard, *tab.* 568. *fig.* 2.

Var. β, *hepaticus*, Fries *Epicr.* p. 122. Ag. subhepaticus, *Batsch El., fig.* 211.

HAB. Lord Auckland's group; in the woods near the sea.

A plant, so far as can be judged from the specimens, which were much damaged by insects before being

gathered, belongs to the species quoted above. The stem is either equal or attenuated upwards, generally smooth, except towards the base, where it is at times clothed with cottony filaments which spread over the soil.

2. CLADOSPORIUM, *Link.*

1. Cladosporium *herbarum*, Link, *Obs.* II. p. 37.

Hab. Lord Auckland's group and Campbell's Island; on the leaves of *Carex appressa*, Br.

This fungus originates beneath the cuticle, in slender dull black parallel lines; it afterwards forces itself through to the surface and resembles some *Puccinia*. No characters exist to distinguish it as a species, though its habit is very peculiar.

3. HENDERSONIA, *Berk.*

1. Hendersonia *microsticta*, Berk.; peritheciis sparsis punctiformibus atris globosis minutis, sporis lanceolatis acutis triseptatis. (Tab. LXVIII. Fig. I.)

Hab. Lord Auckland's group and Campbell's Island; on the withered stems of *Chrysobactron Rossii* of the previous year's growth.

Perithecia parva, epidermide tecta, subprominula, atra, globosa. *Sporæ* pellucidæ, irregulares v. lanceolatæ, utrinque acutæ, triseptatæ, quandoque breviter pedicellatæ; endochromio cellulis conformi.

There are no external characters by which this may be discriminated from several other black punctiform *Fungi*. The structure of the spores indicates a total want of affinity with *Sphæria*; these, under a low power, appear multiseptate or triguttate; but, with a higher lens and well adjusted light, each is seen to be furnished with three transparent septa: their shape is that of *Neottiospora*.

Plate LXVIII. *Fig.* I.—1, stem of *Chrysobactron* with fungus of the *natural size*; 2, a portion of the same, *magnified*.

4. UREDO, *Pers.*

1. Uredo *antarctica*, Berk.; amphigena, maculis oppositis purpureis, soris bullatis, sporis majusculis lævibus late obovatis fuscis. (Tab. LXVIII. Fig. II.)

Hab. Campbell's Island; on leaves of *Luzula crinita*.

Amphigena; maculis parvis, oppositis, subrotundatis, purpureis, subtus pallidioribus. *Sori* bullati. *Sporæ* obsoletissimæ, pedicellatæ, obovatæ v. subglobosæ, læves, guttula centrali oleosa præditi.

External appearance very closely resembling the *Cœoma Luzulæ*, Libert., but the form of the spores is quite different, and also like *Uredo oblongata*, which likewise grows upon *Luzulæ*, but is a very different parasite.

Plate LXVIII. *Fig.* II.—1, leaf of *Luzula* with fungus of *natural size*; 2, portion of ditto, *magnified*; 3, spores very highly magnified.

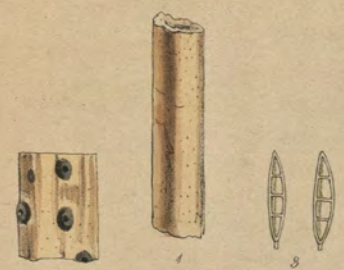
5. SPHÆRIA, *Hall.*

1. Sphæria *herbarum*, Pers. *Synops.* p. 79. (*quoad var.* γ, tectam), *Fr. Syst. Myc.* vol. ii. p. 511. *Notaris in Act. Acad. Turin.* vol. vii. p. 30. *cum analysi optima.* (Tab. LXVIII. Fig. III.)

Hab. Lord Auckland's group and Campbell's Island; on the scapes of *Chrysobactron Rossii* with *Hendersonia microsticta*.

BRANCH OF THE ANTARCTIC

I.

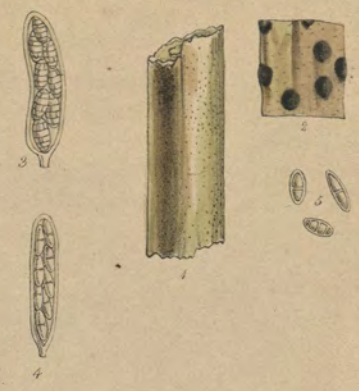


Hend: microsticta.

II.

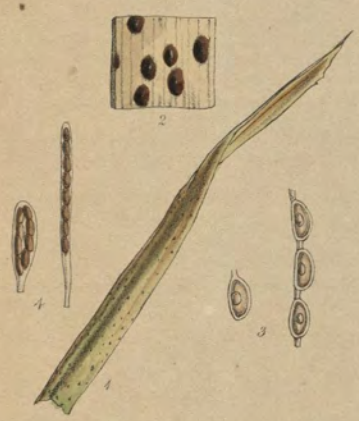
Uredo Antarctica

III.



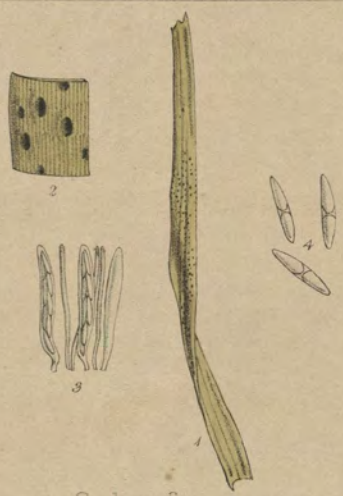
Sphæria herbarum.

IV.



S. phæosticta.

V.



S. depressa.

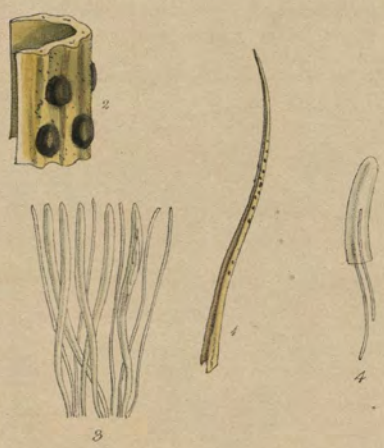
VI.

Doth: circumscripta.

VII.

Ast: dilatatum.

VIII.



Hyst: breve.

IX.

Aylog: Bromi.

M.J.B. & W.F. del.t

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ANTARCTIC EXPEDITION

Fries says of this plant, or rather of what have been referred to it, "Farrago specierum minimarum" and under it two very different productions are given in the 'Scleromycetes Succicæ,' (no. 38). Of one of these, both a larger and smaller form occur; the other is identical with what has been published as a small state of *Sphæria complanata*. I have given, at nos. 267 and 288, of my British 'Fungi' (Fasc. 4th), the latter as Fries's var. minor of *Sp. herbarum* and *Sp. complanata* intending to illustrate his views, and with no idea that it would prove identical with any of the larger or normal species, which are well distinguished by their sporidia. These, in the true *S. herbarum*, are oblong, with several longitudinal and transverse dissepiments, like what are seen in *Sphæria Laburni*, in the specimens before me from Auckland Island and in the larger English form. The plant published in my 'Fasciculi' is destitute of asci, which is the case with *S. acuta*, Hoffm. The analysis of the latter plant as given by Greville, belongs to *S. coniformis* which often occurs on the same stem. It is not properly a *Sphæria* but either a *Sphæronema* or a *Septoria*, as extended by Desmazières, or finally, if *Sphæria* be remodelled according to the plan upon which De Notaris has revised the Italian species, it will come under some new generic name.

On carefully removing the cuticle of the *Chrysobactron*, I find that in the specimens before me the perithecia give out a few stout filaments which creep for a short distance; this I believe to be a common occurrence with the subcuticular species. On the same stalks, individuals having the same external characters occur, in which the sporidia are uniseptate. This form I at first believed to be a distinct species, but am now satisfied that it is an imperfect state of *S. herbarum*; especially since three septa are sometimes visible.

Plate LXVIII. *Fig.* III.—1, stem of *Chrysobactron* with fungus of *natural size*; 2, portion of ditto, *magnified*; 3, ascus of *S. herbarum*; 4, the same, of an immature specimen; 5, sporidia of ditto:—highly *magnified*.

2. Sphæria *nebulosa*, Pers.? *Synops. Fung.* p. 31.

Hab. With the former.

Very imperfect; as are also the published descriptions of *S. nebulosa* itself.

3. Sphæria *nigrella*, Fries? *Syst. Mycol.* v. ii. p. 512.

Hab. With the two former.

Specimens, unfortunately without fructification and therefore scarcely determinable.

4. Sphæria *phæosticta*, Berk.; gregaria, peritheciis globosis atris epidermide fusco-maculato tectis, ostiolo prominulo punctiformi, ascis linearibus, sporidiis uniserialibus fuscis breviter cymbiformibus. (Tab. LXVIII. Fig. IV.)

Hab. Lord Auckland's group and Campbell's Island; on the dead leaves of *Hierochloe Brunonis*.

Gregaria, oculo nudo maculas parvas punctiformes brunneolas exhibens, sub quaque macula perithecium minutum globosum ostiolo subprominulo punctiformi latitat. *Asci* primum breves, sporidiis pellucidis ellipticis biserialibus demum lineares, sporidiis fuscis breviter cymbiformibus uniserialibus, nucleo magno globoso.

I know of no species at all resembling the present. The change in the form of the asci and sporidia is very instructive and confirms me in my opinion, that *Sphæria herbarum* and its accompanying uniseptate state belong to the same species (vid. supra). It is worthy of observation, that the sporidia exhibit these changes whilst still colourless. Septa are however sometimes formed as in the genus *Diplodia* after the spores have acquired their colour.

Plate LXVIII. *Fig.* IV.—1, leaf and fungus of the *natural size*; 2, portion of the same, *magnified*; 3, an immature and mature ascus; 4, sporidia:—all *magnified*.

5. SPHÆRIA (foliicolæ) *depressa*, Berk; gregaria, minor, atra, peritheciis tectis subglobosis lævibus collo destitutis siccitate depressis, sporidiis lanceolatis. (TAB. LXVIII. Fig. V.)

HAB. Campbell's Island; on the dead leaves of *Luzula crinita*.

Gregaria, epidermide atro-punctato omnino tecta. *Perithecia* minora, subglobosa, collo destituta, siccitate depressa. *Asci* lineares, paraphysibus tenuioribus immixti. *Sporidia* biseriata, lanceolata, endochromio bipartito sed non septato.

The only species with which the present can be compared are *S. duplex* and *S. Scirpicola*; from both these it will be found to differ by the external characters given above, and, from the latter in particular, by the simple pellucid and neither triseptate nor yellowish sporidia.

PLATE LXVIII. *Fig.* V.—1, leaf and fungus of the *natural size*; 2, portion of the same, *magnified*; 3, asci and paraphyses; 4, sporidia, shewing the endochrome collected at either extremity; *magnified*.

6. DOTHIDEA *, *Fries*.

1. DOTHIDEA *hemispherica*, Berk; hypogena, solitaria, erumpens, macula subeffusa epiphylla nigra, stromate hemispherico carbonaceo, cellulis ellipticis obtusiusculis, ascis breviusculis, sporidiis uniseptatis oblongis. (TAB. LXVII. Fig. II.)

HAB. Lord Auckland's group; on the leaves of *Veronica odora*.

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* I take the present opportunity of describing two new species of *Dothidea*, contained in the Herbarium of Sir W. J. Hooker.

1. DOTHIDEA *circumscripta*, Berk.; innata, gregaria, maculis suborbicularibus irregularibus depressis nigris nitidis circumscriptis, cellulis paucis magnis depresso-globosis, collo brevi, ostiolo papillæformi, ascis clavatis, sporidiis oblongo-lanceolatis. (TAB. LXVIII. Fig. VI.)

HAB. Andes of Columbia (*Jameson*). Chacapoyas, Peru (*Mathews*); on various species of *Vaccinium*

Hypophylla, rarissime epiphylla, innata. *Maculæ* $\frac{3}{4}$ lin. latæ, suborbiculares v. confluentes, irregulares, depressæ, nigræ, nitidæ, quandoque leviter undulatæ, minutissime granulatæ, ostiolis paucis, papillæformibus notatæ, linea nigra plus minusve evidenter circumscriptæ, demum omnino fatiscentes, et scutellam epidermide marginatam exhibentes. *Cellulæ* fructiferæ paucissimæ, magnæ, globosæ, depressæ, collo brevi, ostiolo papillæformi. *Asci* clavati. *Sporidia* octona, oblonga, hinc acuminata,

A very pretty species, remarkable for the small number of fructifying cells and the dark line enclosing the stroma, which is especially evident when the latter is abortive; beyond this line there is sometimes a coloured ring. The sporidia are almost of the same shape with those figured by Corda, in *Rhytisma Eugeniacearum*; when young they are filled with distinct granules which become less evident as they are more developed. In age the stroma completely decays and falls out, leaving a scutellum surrounded by the cuticle. This follows from the dark line indicating a harder substance than that of the stroma, which is not always externally visible, but will be found on making a vertical section.

PLATE LXVIII. *Fig.* VI.—1, a branch of *Vaccinium* and fungus of the *natural size*; 2, a section, *slightly magnified*; 3, asci, *slightly magnified*; 4, sporidia, *highly magnified*.

2. DOTHIDEA *bullata*, Berk.; epiphylla, bullata, suborbicularis, nigra, superficialis, crassiuscula, rugosa, granulata, intus nigra, cellulis ellipticis, ostiolo papillæformi, ascis oblongis, sporidiis oblongis uniseptatis.

HAB. Peru; on the leaves of a resinous shrub. (*Mathews.*)

Epiphylla, submarginalis, superficialis. *Maculæ* $\frac{1}{4}$ unc. latæ, suborbiculares, crassiusculæ, depresso-bullatæ,

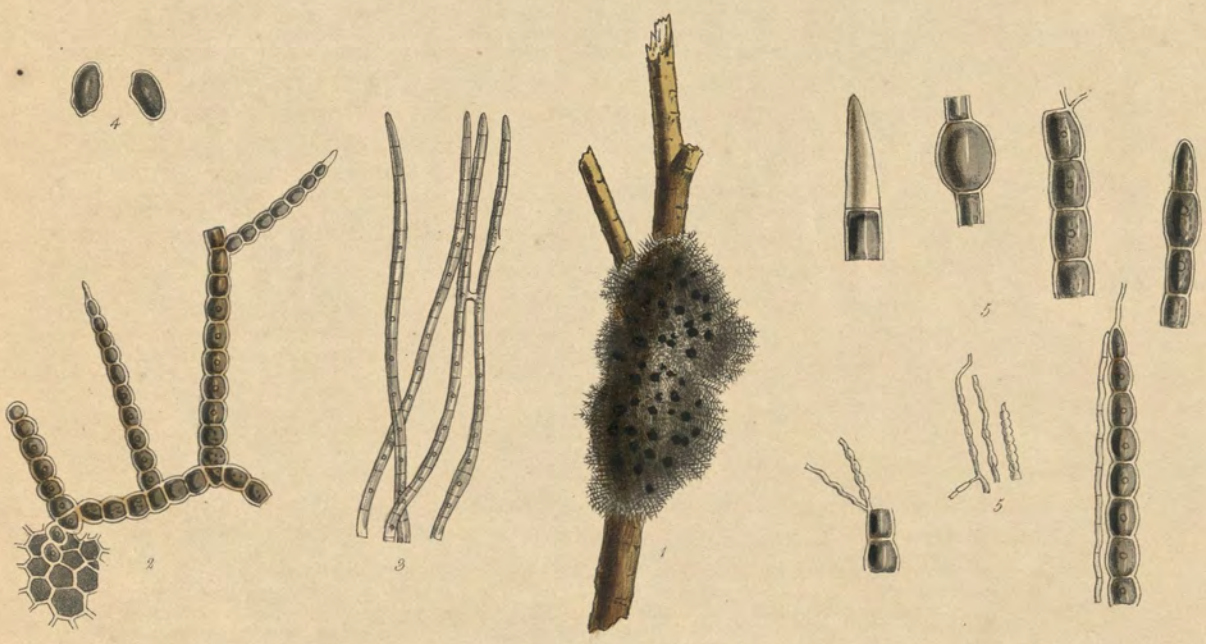
I.

Dothidea spilomea.

II.

D. hemisphærica.

III.



Antennaria scoriadea.

M.J.B & W.F.del.

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Hypogena, nigra, maculam nigram subeffusam superne stromatis indicem exhibens, una tantum macula in singulo folio ut videtur evoluta. *Stroma* $\frac{2}{3}$–1 lin. latum, hemisphericum, carbonaceum, extus scabriusculum, nec evidenter papillato-granulosum, demum fatiscens: intus carbonaceum, superne reticulatim cellulosum, sub lente atro-cæruleum vel demum viridi-fuscum constans, basi in floccos abeunte. *Cellulæ fructiferæ* oblongo-ellipticæ, periphericæ, obtusiusculæ, vix apiculatæ. *Asci* breviusculi. *Sporidia* octona, oblonga, uniseptata, medio constricta.

This species has much more the habit of a *Sphæria* than most *Dothideæ*, being of a carbonaceous texture, like the *Sphæria fragiformis*; but though, on making a delicate vertical section, a thin stratum of tissue, consisting of only a single layer of cells, occasionally appears, no trace of this is seen on the sides of the cavities distinct from the neighbouring tissue. The specimens procured are not numerous, in no instance does more than one individual appear upon a single leaf, the latter being probably of too small a size to support more than a solitary stroma of such high organization. Like some other species indicated by Montagne in his '*Fungi of Cuba*,' this is probably originally produced between the layers of the cuticle, for some of the latter is found beneath the stroma. The cells of the stroma pass at the base into a mass of reticulated filaments, without any membrane being attached to the meshes.

Plate LXVII. *Fig.* II.—1, a sprig of *Veronica odora*, with the fungus of the *natural size*; 2, a section of the fungus; 3, a portion of the same, *more highly magnified*; 4, an ascus; 5, sporidia; 6, a section shewing the loose cellular tissue of the centre, the pentagonal tissue about the base of the cells, and the elongated tissue between them:—all *magnified*.

2. Dothidea *spilomea*, Berk.; gregaria, hypophylla, maculis epiphyllis nullis v. obsoletissimis, subinnata, depressa, tenuis, orbicularis, sæpe confluens, minutissime granulosa, nitida, cellulis globosis, ascis clavatis, sporidiis oblongis uniseptatis medio constrictis. (Tab. LXVII. Fig. I.)

Hab. Lord Auckland's group and Campbell's Island; on the leaves of *Veronica elliptica*, Forst.

Hypogena, nigra, nitida; maculis $\frac{1}{2}$–$\frac{1}{6}$ lin. latis, gregariis, orbicularibus, quandoque confluentibus, depressis, subinnatis, tenuibus, minutissime granulatis. *Stroma* tenue, subtus cum parenchymate confusum. *Cellulæ fructiferæ* globosæ, ostiolo punctiformi. *Asci* clavati. *Sporidia* oblonga, quandoque curvata, uniseptata, medio constricta.

In some leaves the spots are very numerous, in others they are but few and of a larger size. The species is most allied to the *D. amphimelana*, Mont., and *D. Zollingeri*, B. and M., although not very near either; it exhibits, also, some affinity with *D. granulosa*, Hook. et Arn. Externally it strongly resembles the punctiform variety of *Rhytisma salicinum*. The spots are of a shining black, and are very minutely granulated under a lens.

Plate LXVII. *Fig.* I.—1, a sprig of *Veronica elliptica*, covered with the parasite, of the *natural size*; 2, a section, *slightly magnified*; 3, ditto, *more highly magnified*; 4, asci; 5, sporidia: *magnified*.

7. ASTEROMA, *Dec.*

1. Asteroma *dilatatum*, Berk.; superficiale, maculis ricciæformibus, lobis dilatatis e filamentis serpentibus approximatis in membranam congestis. (Tab. LXVIII. Fig. VII.)

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nigræ, non tamen nitidæ, rugosiusculæ, granulatæ, intus nigræ, substantia sub lente fusca. *Cellulæ fructiferæ* ellipticæ, albo-farctæ, ostiolo papillæformi. *Asci* oblongi, basin versus latiores. *Sporidia* oblonga, uniseptata.

A very fine species, allied to *D. amphimelana*, Mont., *D. Rutæ* and *D. puccinioides*. The first of these is more regular and innate, besides having a spot on the under side opposite to that on the upper; whereas, in the present species, in consequence of the superficial mode of growth, there is no such spot. *D. amphimelana* has no evident border to the stroma. *D. Rutæ* has uniseptate sporidia, but they are short and brown; in which respect also *D. bullata* differs from *D. puccinioides*, and in several other characters from both, as its much larger size.

Hab. Lord Auckland's group; on the leaves of *Panax simplex*, Forst.

Maculæ omnino superficiales, orbiculares, epiphyllæ, 2 lin. latæ, opacæ, olivaceo-nigræ, *Lichenem* parvum *Fucumve* referentes, lobatæ, lobis apice dilatatis e filamentis approximatis constantibus.

This pretty species, which was unfortunately not found in fruit, resembles somewhat *Rhytisma quercinum*, Rudolph, for which I am indebted to Dr. Montagne. That species, however, originates beneath the cuticle, while this is, I believe, entirely superficial. The ramification is different, the tips of the branches being dilated in a flabellate form. The stroma, also, consists of approximated threads, not of an irregular cellular membrane. This structure is almost identical with that of *Myrionema punctiforme*, Harv., except that the filaments are there much branched, which I do not find to be the case here.

This species is accompanied with another in a very imperfect state, and which may be a species of *Dothidea*.

Plate LXVIII. *Fig.* VII.—1, leaf of *Panax*, with fungus, of the *natural size*; 2, portion of the same, *magnified*; 3, filaments, *very highly magnified.*

8. HYSTERIUM, *Tod.*

1. Hysterium *breve*, Berk.; peritheciis brevibus ellipticis nigris prominulis, rima angustissima, ascis linearibus elongatis. (Tab. LXVIII. Fig. VIII.)

Hab. Campbell's Island; on the dead leaves of *Uncinia Hookeri*, Boott.

Perithecia minuta, nigra, nitida, prominula, breviter elliptica, raro utrinque apiculata, rima angustissima. *Asci* elongati, lineares, paraphysibus filiformibus rectiusculis immixti, sporidiis filiformibus.

This species is manifestly different from the small form of *H. culmigenum*, and the nature of the asci and paraphyses are further distinct, being in the latter plant shorter and of a different form, with the apices of the paraphyses curved or curled. The apiculate extremities may not prove to be a constant character, though the probability is that it will, at least in full grown specimens.

Plate LXVIII. *Fig.* VIII.—1, leaf and fungus of the *natural size*; 2, portion of the same; 3, perithecium shewing the contained asci; 4, ascus; all more or less *magnified.*

9. AYLOGRAPHUM, *Libert.*

1. Aylographum *Bromi*, Berk.; peritheciis simplicibus filis arachnoideis comitatis, sporidiis oblongis uniseptatis medio constrictis. (Tab. LXVIII. Fig. IX.)

Hab. Lord Auckland's group; on the leaves of *Bromus antarcticus.*

Mycelium arachnoideum, fuscum, quandoque abundantius et sterile, in maculis autem fertilibus parcum. *Perithecia* minima, oblonga, brevia, recta v. curvata, simplicia, atra, nitida. *Asci* brevissimi, obovati, tenerrimi. *Sporæ* octonæ, oblongo-ellipticæ, medio constrictæ, uniseptatæ.

The species of this genus, which has principally been investigated by Madame Libert, resemble extremely minute *Opegraphæ*. The present individual approaches the *A. junceum*, but differs from it and from all others by the septate sporidia. The perithecium easily breaks up into its elemental cells, and such I find to be also the case with some of Madame Libert's species; while, in others, the cellular structure is more permanent and forms a beautiful microscopic object.

Plate LXVIII. *Fig.* IX.—1, a portion of leaf and fungus, of the *natural size*; 2, perithecium, *magnified*, showing the contained asci; 3, ascus; and 4, sporidia:—*highly magnified.*

10. ANTENNARIA, *Link.*

1. Antennaria *scoriadea*, Berk.; spongiosa, floccis fasciculatis sursum lateraliter connexis, peridiis subellipticis irregularibus. (Tab. LXVII. Fig. III.)

Hab. Lord Auckland's group and Campbell's Island; on the branches and twigs of several shrubs and trees, but especially of *Dracophyllum longifolium*.

Spongiosa, ramos incrustans. *Flocci* ¼–½ unc. longi, fasciculati, superne processibus brevibus lateralibus more *Zygnematis* connexi, subtus e membrana reticulata vel mycelio repente nascenti, filamentis tenuioribus immixti, erecti, irregulariter ramosi. *Articuli* moniliformes vel præsertim in filamentis ultimis continui, læves, nucleo globoso solitario. *Perithecia* subelliptica, irregularia.

A very singular substance, which must strike the traveller through the woods especially of New Zealand or of Lord Auckland's group, in both which localities it is very abundant, resembling charcoal, and sometimes so widely diffused that the branches look as if burnt. The colonists of the former islands call it "the black moss." Distinguished from *A. pannosa* and *A. Robinsonii* by its long fasciculate threads, giving it exactly the habit of *Scorias spongiosa*. The finest specimens have a rigid bristly appearance, quite different from that of any other species of the genus. This has been also gathered in Valparaiso by Mr. Bridges, and at the Swan River by Mr. Drummond. I have not been able to trace the developement of the peridia in the Auckland Island specimens, but it would appear that, as in *M. Robinsonii*, M. and B., they arise either from a swollen articulation or from a process given off by an articulation, in either case they are dependent on a simple metamorphosis of the latter.

Plate LXVII. *Fig.* III.—1, a plant of the *natural size*; 2, flocci from the base of the tufts, with a portion of the cellular matrix; 3, flocci from the summits of the tufts, laterally aggregated; 4, sporangia; 5, portions of the filaments in various states:—*all more or less highly magnified.*

11. SCLEROTIUM, *Tod.*

1. Sclerotium *durum*, Pers. *Synops. Fung.* p. 121.

Hab. Lord Auckland's group; on the capsules of *Gentiana concinna*.

This production is enumerated here because it has hitherto appeared in the works of Mycologists, but I am decidedly of Léveille's opinion that it should be expunged.

XXXVI. ALGÆ, *L.*

By W. H. Harvey, Esq., M.D., and J. D. Hooker.

1. MARGINARIA, *A. Rich.*

Radix ramosa. *Frons* plana, linearis, sursum flabellato-pinnata; pinnis coriaceo-membranaceis, spinuloso-dentatis, enerviis, dichotome fissis; margine superiore vesiculas petiolatas receptaculaque gerente. *Conceptacula* receptaculis semi-immersa, globosa, poro pertusa. "*Sporæ* magnæ, obovato-pyriformes, perisporio initio inclusæ, mox nudæ, e cellulis parietalibus oriundæ, paraphysibus immixtæ, in *M. Boryana* vero e morphosi ultimi articuli filorum ut videtur ortæ, forsan hinc minutæ et tantum ut gemmæ habendæ."—*Mont.*

Obs. The genera *Marginaria*, A. Rich., *Carpophyllum*, Grev., *Scytothalia*, Grev., and *Seirococcus*, Grev., are all very closely related to each other, and to *Sargassum*. From the latter they differ more by possessing a frondose, imperfectly leafy mode of growth, than by any very decided structural character; and habit alone will scarcely separate some of them from the decurrent species of that genus, *S. decurrens*, *Peronii*, *Boryi*, &c. These last have

lately been erected into a distinct genus, by Kützing, under the name of *Pterocaulon*, and on grounds equally valid with those which separate some of the above groups. *Seirococcus* was distinguished from *Scytothalia* by Dr. Greville, by having moniliform instead of oblong or lanceolate receptacles; but the genera have been reunited by Montagne, who has added a new species (*Scyt. Jacquinotii*), and this last approximates so closely to *Marginaria*, as to reduce the clearly appreciable differences between *Scytothalia*, Mont., and *Marginaria*, to the former having entire and the latter spinuloso-dentate margins,—a circumstance of very minor importance, and perhaps of specific value only. *Carpophyllum* may be distinguished by the position of its vesicles and the clustering of its receptacles from *Fucus*; on the other hand it approaches *Sargassum* through *S. Boryi*, Ag. *Marginaria* contains but two species, of which Kützing in his late work constitutes as many genera. A. Richard, on the contrary, struck with the slight characters on which he had established *Marginaria*, afterwards combined it with *Sargassum*.

The paraphyses, so carefully described by Montagne in the generic character as occuring mixed with the spores, answer well to the antheridia observed lately by MM. Decaisne and Thuret in *Fucus*, whence this species would be regarded by these authors as hermaphrodite.

1. Marginaria *Urvilleana*, A. Rich.; *Montagne Prodr. Phycear. in itin. ad Polum Antarct.* p. 10. *Voy. au Pole Sud, Bot. Crypt.* p. 60. t. 3. f. 1. *A. Rich. Fl. Nov. Zel.* p. 10. t. 3. Sargassum Urvilleanum, *A. Rich. Sert. Astrolab.* p. 138. *A. Cunn. in Hook. Comp. to Bot. Mag.* vol. ii. p. 327.

Hab. Lord Auckland's group; very abundant in shallow water.

Pinnæ 12–18 unc. longæ, $\frac{3}{4}$–1 unc. latæ, coriaceo-membranaceæ, nigro-fuscæ, planæ, læves, enerves, argute serratæ, obtusæ, basi sensim attenuatæ, subpetiolatæ, irregulariter dichotome fissæ, ramis superioribus plerumque simplicibus, inferioribus divisis, sinubus angustis rotundatis, laciniis erecto-patentibus. *Vesiculæ* sphæricæ, 4–8 lin. latæ, muticæ, petiolo inconspicuo plano 1 lin. longo suffultæ, margine pinnularum superiori affixæ. *Receptacula* breviter pedunculata, 2–3 lin. longa, ad basin frondis secus marginem superiorem in serie elongata inserta, divaricata, lanceolata, obtusa, compressa, torulosa. *Conceptacula* globosa, receptaculis immersa, demum plus minusve convexa, poro pertusa. *Sporæ* exemplaribus nostris immaturæ.

Dr. Montagne enumerates *Blossevillea retorta*, Mont., and *B. retroflexa*, Kütz., as natives of Lord Auckland's group, and also the *Carpophyllum macrophyllum*, Mont.

2. D'URVILLEA, *Bory.*

1. D'Urvillea *utilis*, Bory *in Duperrey Voy. Bot. Crypt.* p. 65. t. 1 and 2. f. 2. *D'Urville, Fl. Ins. Mal. in Mém. Soc. Linn. Paris*, vol. iv. p. 594. *Montagne, Crypt. Boliv.* et in *Voy. au Pole Sud, Bot. Crypt.* p. 23. *Decaisne in Archiv. Mus.* vol. iv. p. 153. t. 5. f. 1–6. *Postels et Ruppr., Illust. Alg.* t. 1. Fucus antarcticus, *Chamisso in Choris, Voy. Pittor.* t. 7.

Hab. Lord Auckland's group and Campbell's Island, and in the open sea for ten degrees southward of these groups.

The distribution of this species will be considered with that of the genus *Macrocystis* in the second portion of the *Flora Antarctica*.

3. XIPHOPHORA, *Mont.*

Frons olivacea, linearis, compresso-plana, coriacea, dichotome ramosa. *Vesiculæ* nullæ. *Conceptacula* per totam frondem sparsa, ramis immersa, tuberculiformia, poro pertusa, intus naturæ diversæ; *altera* sporas obovatas, nigro-fuscas, demum quadripartitas, limbo hyalino cinctas, parietibus affixas, sessiles; *altera* fasciculos filorum ramosorum, articulatorum, apicibus turgidis et demum in corpuscula granulis repleta (*antheridia* vel *gemmas*) mutatos foventia.

We fully agree with our excellent friend Montagne in the propriety of establishing the present genus, and

Dictyosiphon fasciculatus.

Adenocystis Lefsoni.

Xiphophora Billardieri (tetraspores)

J.D.H. & W.P. del.

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for the several reasons adduced by him in his memoir, in the '*Annales des Sciences Naturelles*,' Oct. 1842. He must allow us, however, to claim for La Billardière, not only the discovery of the plant, but that of its fruit also; for, though the description of that author be imperfect, there can exist no doubt that the tubercles immersed in the frond, which he notices, are what we now know to be fructification. We further enter our protest against the system of changing the specific name from *gladiatus*, which is quite unexceptionable, to *Billardieri*. In the general character we have described the spores as finally divided into four, more or less unequal parts, when they resemble the tetraspores of several *Florideæ*, which doubtless, as demonstrated by M. Decaisne and Thuret in other *Fucaceæ*, form together but a single spore. Young, and even nearly mature, seeds exhibit no traces of this internal division; while those that are fully grown and have assumed a dark colour, are divided by very clear lines and even spaces. "With regard to other organs in the *Fucaceæ*, which M. Montagne calls gemmæ or acrosperms, we incline to consider them analogous to what are termed antheridia in some other families." *

1. Xiphophora *Billardieri*, Mont. *Prodr. Nov. Phyc. in itin. ad Polum Antarct.* p. 12. *Voy. au Pole Sud, Bot. Crypt.* p. 55. t. 7. f. 1. Fucus gladiatus, *Labill. Pl. Nov. Holl.* II. p. 3. t. 256. *Encycl. Meth. Bot. Suppl.* V. p. 439. *Lamouroux in Mem. du Mus. d'Hist. Nat.* XX. p. 36. *Turner, Hist. Fuc.* t. 240. *Berkeley in Ann. Nat. Hist. for* 1843, p. 57. Ctenodus, *Kützing*. (Tab. LXIX. Fig. III.)

Hab. Lord Auckland's group; on rocks in the sea, very abundant.

Conceptacula per totam frondis longitudinem præcipue apicem versus sparsa, immersa, tuberculiformia, leviter convexa, poro pertusa, externe consimilia, interne nucleis diversis instructa. *Altera* sporas obovatas v. pyriformes. *Sporæ* magnæ, sessiles, e cellulis parietalibus ortæ, perisporio hyalino circumdatæ, nucleo primum simplici demum quadripartito nigro-fusco donatæ, cum paraphysibus simplicibus articulatis filiformibus achromaticis commixtæ. *Altera* contra filis ramosissimis tenuibus hyalinis articulatis farciuntur, quorum externi turgidi materie granulosa repleta evadunt.

Plate LXIX. *Fig.* III.—Divided spores of *Xiphophora* (called erroneously tetraspores on the plate).

4. LAMINARIA, *Ag.*

1. Laminaria, (sp.)?

Hab. Campbell's Island. (*Dr. Lyall.*)

A fragment of a young frond, too imperfect for description or determination of the species.

* The remark in inverted commas was made by Dr. Harvey.—The division of the spores of *Fucaceæ* was observed while examining the *D'Urvillea utilis* in a fresh state, when they were considered as tetraspores, and again by Dr. Montagne and by myself, in dried specimens of *Xiphophora*. More recently, and since the above was written, the interesting paper of MM. Decaisne and Thuret has appeared, in the '*Annales des Sc. Nat.*' (Series 3. vol. iii. p. 1.) It is there shown that this structure exists in five species of *Fucus* abundant on our shores; *F. nodosus, serratus, vesiculosus, canaliculatus* and *tuberculatus*: also in *Himanthalia*, which I have elsewhere allied to *D'Urvillea* (London Journ. of Botany, vol. ii. p. 325), and the mode of division in the original spores is excellently followed and illustrated, as also their germination, a most important point. I cannot omit here an allusion to two of the most remarkable recent discoveries in modern Botanical Science, made by those observers, and published in the same paper:—that of organs, in every respect analogous to the antheridia of mosses (of whose nature my coadjutor, Mr. Harvey, had formed the same idea), existing in all the above-mentioned *Fuci*; and these antheridia being wholly filled, before bursting, with bodies endowed with rapid motion and apparent volition, and which, though thus proved to be truly of vegetable origin, have hitherto been ranked in the animal kingdom. I am indebted to the friendship of M. Decaisne for a demonstration of these curious phenomena in living *Algæ*, and for the original drawings from which the plates that accompany his interesting paper in the '*Annales*' are executed.—J. D. H.

5. MACROCYSTIS, *Ag.*

1. Macrocystis *pyrifera*, Agardh, *Sp.* vol. i. p. 47. *Nov. Act. Nat. Cur.* vol. xix. p. 297. t. 26. f. 1.

Hab. Lord Auckland's group, Campbell's Island, and in the open sea to the south as far as the 65th degree.

The observations on this genus and its distribution, are reserved for the Cryptogamic portion of the other Antarctic Islands.

6. DESMARESTIA, *Lamour.*

1. Desmarestia *viridis*, Lamour.; fronde cartilaginea basi subcompressa, supra cylindracea decomposito-pinnata, pinnis pinnulisque exacte oppositis filiformibus ultimis capillaribus. D. viridis, *Lamour. in Ann. Mus.* xx. 25. *Endl. Gen. Pl. Suppl.* vol. iii. p. 28. *Kütz. Phyc. Gen.* p. 344. Dichloria viridis, *Grev. Alg. Brit.* p. 36. t. 6. Sporochnus viridis, *Ag. Spec. Alg.* vol. i. p. 154. *Syst.* p. 259. Fucus viridis, *Fl. Dan.* t. 886. *Turn. Hist. Fuc.* t. 97. *Engl. Bot.* t. 1669.

Hab. Lord Auckland's group. (*Dr. Lyall.*)

We defer our remarks on this plant, and on the genus *Desmarestia* in general, to a future portion of this work. The present species was found abundantly at Christmas Harbour in Kerguelen's Land, Berkeley Sound, and Port William in the Falkland Islands, and at Cape Horn; and will, therefore, come more properly along with some new species into the flora of those regions.

7. DICTYOSIPHON, *Grev.*

Obs. The following species differs in some points from this genus, being of a thicker substance and denser structure, and with the walls composed of a greater number of rows of cells, which are themselves very much smaller. The surface of the frond is, therefore, not in the least reticulated. Still the fructification is so identical with that of *Dictyosiphon*, that we are unwilling to separate it, especially since the habit is not dissimilar.

1. Dictyosiphon? *fasciculatus*, Hook. fil. et Harv.; caule filiformi subindiviso, ramis abbreviatis pluries ramosis quadrifariis raro oppositis sæpissime fasciculatis alternis vel secundis omnibus ramulisque basi attenuatis acutis, sporis densissime per ramulos sparsis semi-immersis. (Tab. LXIX. Fig. I.)

Hab. Lord Auckland's group; on rocks in the sea.

Radix pusilla? *Frondes* circumscriptione lanceolatæ, cæspitosæ, 4–8 unc. longæ, fusco-olivaceæ, membranaceæ, vix coriaceæ, cylindraceæ, v. subcompressæ, primo filis articulatis laxe repletæ, mox tubulosæ et cavæ, e cellulis minutis coloratis rotundis 3–4 serialibus interioribus majoribus formatæ. *Caulis* indivisus vel basi in ramos elongatos simplices partitus, inferne setaceus, supra sensim latior, medio ½–1 lin. latus, apicem versus attenuatus, per totam longitudinem ramis plurimis patentibus vestitus. *Rami* breves, 1–2 unc. longi, nunc brevissimi, utrinque attenuati, irregulariter inserti, nunc quadrifarii, nunc subdistichi, sæpissime fasciculati, alterni vel secundi, rarius oppositi; ramulis conformibus setaceis, gracilibus, erectis, alternis, oppositis v. fasciculatis, simplicibus, basi attenuatis apice subulatis. *Axillæ* acutæ. *Sporæ* olivaceæ v. nigræ, ovales, per totam frondem sparsæ, nec in soros aggregatæ, limbo tenui hyalino cinctæ, semi-immersæ, demum prominulæ.

A single specimen of this plant, which seems to be common in Lord Auckland's group, was picked up by Dr. Lyall in Berkeley Sound, Falkland Islands. It was more bushy than the Auckland Island specimen, with longer branches; the outline is ovate and not lanceolate; the main branches chiefly are crowded and fasciculate, the minor ones of the ramuli more frequently distichous, often opposite and rather patent. In fact, part of the plant exhibits the bushy aspect of *Dictyosiphon* and part resembles *Striaria*; the scattered fruit distinguishing it from the latter genus.

Plate LXIX. *Fig.* I.—1, a specimen of the *natural size*; 2, branch; 3, section of ditto;—*magnified.*

8. CHORDA, *Stackh.*

Frons tubulosa, filiformis, simplex, intus transversim septata, extus filis minutis clavatis horizontalibus omnino velata. *Fructus*: *sporæ* pyriformes filis peripheriis immersæ.

1. CHORDA *lomentaria*, Lyngb., *Hydr. Dan.* p. 74. t. 18. *Grev. Alg. Brit.* p. 48. *Hook. Br. Fl.* vol. ii. p. 276. *Harv. Br. Alg.* p. 35. *Wyatt, Alg. Danm.* no. 6. Scytosiphon Filum, var. γ. *Ag. Sp. Alg.* vol. i. p. 162. *Ag. Syst.* p. 257. C. rimosa, *Mont.*? *Prod. Phyc. Antarct.* p. 12. *Voy. au Pole Sud, Bot. Crypt.* p. 44.

HAB. Lord Auckland's group; on rocks in the sea.

Radix scutata. *Frons* (in exemplaribus Aucklandicis) pedalis, 2 lin. lata, basi tenuissima, longe setaceo-filiformis, sursum sensim latior, apicem versus subattenuata vel acuminata, remote septata, constricta, interdum subcontinua et æqualis. *Color* sordide badius v. fusco-olivaceus. *Superficies tota* filis clavatis minutissimis sporis immixtis velata.—Chartæ arcte adhæret.

These specimens differ slightly from the European form of the species, in having the constrictions less obvious and at much wider intervals. In some individuals scarcely any constriction occurs, and then it is not easy at first sight to distinguish them from a common state of *Asperococcus echinatus*. In others, again, they are evident, and microscopical examination proves that they do not belong to *Asperococcus*. At the Falkland Islands this plant was also found, and the specimens from that locality are identical with the common European appearance.

9. ADENOCYSTIS, *Hook. fil. et Harv.*

Radix scutata. *Frons* membranacea, saccata, intus cava, aqua repleta, foveis convexis opacis fila arachnoidea emittentibus conspersa, filis minutis clavatis omnino velata. *Fructus*: *sporæ* pyriformes filis peripheriis immersæ.

OBS. This genus differs from *Asperococcus* in having its fructification spread over the entire surface, as in *Chorda*, and not confined to distinct sori; and from the latter in being destitute of septa, and in possessing innumerable pale depressions, composed of radiating filaments with very short coloured joints, emitting from their apices tufts of colourless, long, jointed, byssoid fibres. These appear afterwards to fall away, leaving depressions and often punctures of the membrane in their place. The tufts of arachnoid fibres do not expand well after having been dried, though they may always be found in the damaged state, by carefully scraping away the surface of the frond.

1. ADENOCYSTIS *Lessoni*, Hook. fil. et Harv.; Asperococcus Lessoni, *Bory, in Duperrey Voy.* p. 199. t. 11. f. 2. *Grev. Syn.* p. xlii. *Endl. Gen. Supp.* vol. iii. p. 26. (TAB. LXIX. Fig. II.)

HAB. Lord Auckland's group; on rocks left by the tide, abundant.

Radix scutata, exigua. *Frondes* 1½ unc. longæ, ½ latæ, cæspitosæ, e stipite setaceo-filiformi 1 lin. longo ortæ, ellipticæ vel obovatæ, inflatæ, aqua semper repletæ, obtusissimæ, membranaceæ, vix reticulatæ, cellulis minutissimis constitutæ, glandulis superficiariis v. subimmersis convexis dense conspersæ. *Glandulæ* hemisphæricæ, e filis minutis radiantibus brevissime articulatis atro-fuscis formatæ, fibrillas penicillatas longe articulatas hyalinas arachnoideas apice gerentes, demum concavæ. *Superficies frondis* filis coloratis (endochromaticis) minutissime clavatis erectis in strato tenuissimo connexis induta. *Sporæ* obovatæ, nigro-fuscæ, limbo hyalino cinctæ, per totam frondem sparsæ, filis peripheriis immersæ, sessiles. *Color* fusco-olivaceus, sordidus. *Substantia* mollis.—Chartæ adhæret.

Our plant strongly resembles the *Fucus saccatus* of Turner, (*Dumontia saccata*), especially specimens from Nootka Sound; a close microscopic examination being necessary to distinguish them. Possibly the plant, alluded to by Turner, in his description of *F. saccatus*, as having been sent to him from New Holland by Mr. Brown, and

which that author regarded as a species of *Asperococcus*, may be identical with the present, it being very abundant throughout the Antarctic Islands, even so far as 64° south, where it inhabits the Icy Sea.

PLATE LXIX. *Fig.* II.—1, a portion of the frond, in an old state, exhibiting a depression from which the filaments are given off; 2, 3, and 4, spores which cover the whole surface of the frond; 5, full formed spore:—all highly *magnified*.

10. ASPEROCOCCUS, *Lamour.*

1. ASPEROCOCCUS *echinatus*, Grev., *Alg. Brit.* p. 49. t. 9. A. rugosus, *Lamour. Essai*, p. 62. Encœlium echinatum, *Ag. Sp. Alg.* vol. i. p. 145.

HAB. Lord Auckland's group; on rocks in the sea, very common.

11. CHORDARIA, *Agardh.*

1. CHORDARIA *flagelliformis*; Ag. *Sp. Alg.* vol. i. p. 166. *Syst.* p. 256. *Lyngb. Hydr. Dan.* t. 13. *Hook. Br. Fl.* vol. ii. p. 275. *Grev. Alg. Brit.* p. 45. t. 7. *Harv. Man.* p. 45. *Wyatt, Alg. Danm.* no. 57. Fucus flagelliformis, *Turner, Hist. Fuc.* t. 85. *Engl. Bot.* t. 1222.

HAB. Campbell's Island. (*Dr. Lyall.*)

Apparently identical with the British plant.

12. SPHACELARIA, *Lyngb.*

1. SPHACELARIA *funicularis*, Mont.; fronde basi stuposa in ramis paucis crassis ramulis densissime vestitis apice flabellatim partitis divisa, ramis ultimis fasciculatis elongatis fastigiatis circumscriptione obovatis ramulis elongatis articulatis dichotome pinnatis obsessis. S. funicularis, *Mont. Prodr. Phyc., &c.*, p. 13. *Voy. au Pole Sud, Bot. Crypt.* p. 88. t. 14. f. 1.

HAB. Lord Auckland's group; on rocks left by the tide, very abundant.

Radix magna, filis brunneis ramosis intricatis vel stupa obtecta. *Caulis* 3–4 unc. longus, 1 lin. diam. subdichotome in ramos paucos divisus, totus densissime ramulis quadrifariis abbreviatis pinnulatis vestitus. *Rami* apice flabellatim fastigiati; minores graciles, erecti, simplices, ramulis dimorphis quadrifariis obsiti, aliis abbreviatis subappressis simplicibus subulatis, alteris elongatis dichotome pinnatis, pinnulis alterne furcatis vel sub-bipinnatis, pinnis pinnulisque elongatis remotis. *Apices* nunc acuti, nunc sphacelati, massam sporarum includentes. *Color* olivaceus. *Substantia* rigida, dura.

Nearly allied to *S. scoparia*, Lyngb.

12. RHODOMELA, *Ag.*

1. RHODOMELA *glomerulata*, Mont.; "fronde tereti filiformi siccitate longitrorsum striata ramosissima, ramis circumscriptione corymbosis iterum ramosis, ramentis lateralibus simplicibus aut bifidis corniformibus fasciculum sessilem stichidiorum oblongorum vel ovato-lanceolatorum sinu foventibus." *Mont. Prodr. Phyc. Antarct.* p. 4. *Voy. au Pole Sud, Bot. Crypt.* p. 141.

HAB. Lord Auckland's group. (*Admiral D'Urville.*)

The *R. Gaimardi*, Gaud.? of Montagne is certainly our *Polysiphonia botryocarpa*.

13. POLYZONIA, *Suhr.*

1. POLYZONIA *cuneifolia*, Mont.; surculo articulato polysiphonio repente, caulibus erectis filiformibus

Polyzonia cuneifolia. Mont.

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Polysiphonia botryocarpa.

J.D.H. & W.F. del.t

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articulatis alternatim ramosissimis, ramis ramulisque patentibus simplicibus elongatis, foliis distichis breve petiolatis trapeziformibus basi cuneatis apice abrupte truncatis, margine inferiore integerrimo superiore inciso-dentato v. lobato, stichidiis spicatis supra-axillaribus lanceolatis dentatis, ceramidiis axillaribus sessilibus solitariis ovatis v. suburceolatis. P. cuneifolia, *Mont. Prodr. Phyc. Antarct.* p. 4. *Voy. au Pole Sud, Bot. Crypt.* p. 143. (Tab. LXXVI.)

Hab. Lord Auckland's group and Campbell's Island; abundant on the stems of the larger *Algæ*.

Frondes primordiales repentes, caulibus *algarum* radicibus disciformibus seriatim affixæ, multistriatæ, foliis distichis ornatæ. *Caules* e surculis repentibus orti, erecti, setacei, 4–5 unc. longi, distiche foliosi, articulati, indivisi; ramis plurimis, patentibus, elongatis, simplicibus, distiche alternis vel secundis; ramulis conformibus, alternis v. secundis. *Folia* patentia, disticha, 1. lin. longa, breve petiolata, sæpissime trapezoidea, rarius subrotundata, apice truncata, basi late cuneata v. deltoidea; margine inferiore stricto, integerrimo, superiore lacero-dentato, v. 4–5-lobato, lobis serratis. *Ceramidia* ovato-urceolata, in sinu folii profunde fissi sessilia, sporarum fasciculum pyriforme foventia. *Stichidia* in spicis supra-axillaribus foliosis (v. bracteatis) ordinata, sessilia, lanceolata, dentata, sphærosporarum seriem solitariam includentia. *Sphærosporæ* magnæ, atro-rubescentes. *Color* amæne roseus, siccitate vix et ne vix nigricans. *Substantia* membranacea.—Chartæ laxe adhæret.

Most of the numerous specimens of this truly beautiful plant are covered with fructification, chiefly stichidia, the ceramidia being, as is the case with many of the *Rhodomeleæ*, much more rarely produced.

Plate LXXVI. *Fig.* 1, a leaf; 2, a branch bearing stichidia; 3, a stichidium; 4, a branch with ceramidia; 5, a ceramidium; 6, spores from the same:—*magnified.*

14. POLYSIPHONIA, *Grev.*

1. Polysiphonia *botryocarpa*, Hook. fil. et Harv.; caule inarticulato valido elongato flexuoso, ramis alterne ramosissimis, ramulis erecto-patentibus alternis secundis sensim attenuatis ultimis subulatis articulatis, articulis multistriatis diametro æquantibus, capsulis minutissimis ovatis in glomerulis parvis pedicellatis densissime congestis, stichidiis seriatim affixis lanceolatis. Rhodom. Gaimardi, *Gaud.? Montagne, Voy. au Pole Sud, Bot. Crypt.* p. 140. (Tab. LXX.)

Var. *α*, *crassior*; caule alternatim et angulatim flexuoso, ramulis crebrioribus.

Var. *β*, *tenuior*; caule curvato, ramulis elongatis minus divisis.

Hab. Lord Auckland's group; both varieties abundant on the roots of large *Algæ*, &c.

Radix scutella parva, fibris suppeditata. *Caulis* 8–14 unc. longus, basi ½ lin. diam. sursum attenuatus, cartilagineus, opacus, venis anastomosantibus reticulatus, alternatim flexuosus, nunc geniculatus, nunc curvatus v. alterne arcuatus, subsimplex vel e basi parce divisus. *Rami* alterni, cauli conformes, inter se circumscriptione late ovati, plus minusve decompositi, alterne v. secunde partiti, non vere dichotomi. *Ramuli ultimi* alterni v. dichotomi, subulati, erecti v. erecto-patentes, simplices, articulati, articulis 4–5-striatis, diametro æquantibus. *Siphones* in ramis majoribus septem principales tubulum centralem angustum radiatim cingentes, cellulis irregularibus peripheriam versus sensim minoribus circumdati. *Color* atro-rubescens. *Ceramidia* minutissima, ovata, in glomerulis perpusillis subterminalibus lateralibus v. axillaribus aggregata, in quoque glomerulo numerosissima, pedicellata, sporarum pyriformium fasciculum includentia. *Stichidia* ramulis ultimis seriatim affixa, remotiuscula, sphærosporas majusculas angulatas pluriseriatas includentia:—Chartæ laxe adhæret.

This species is of so large a size, such considerable diameter of filament, is so opaque and withal exhibits such slight external appearance of articulation, that it seems at first sight, to possess considerable affinity with *Rhodomela*, and further bears a strong resemblance to *R. subfusca*, which it exceeds in size, while agreeing with it in ramification. A careful examination, however, induces us to place it in *Polysiphonia*, and in the section to which *P. fruticulosa*

belongs. The internal structure of the stem is similar to that of *P. fruticulosa*, but there are fewer radiating fibres, and is quite unlike that of *Rhod. subfusca*. There are two varieties, one more robust, flexuous and densely branched than the other; but they do not appear specifically distinct. Both bear capsular fruit, of a peculiarly clustered character, different from that of any other *Polysiphonia*, and we regard it as the principal distinction on which the species rests. The capsules are farther remarkable for their minuteness in proportion to the plant producing them. Their number, however, compensates for size, thirty or forty occupying a space not greater than that of a capsule of the dimensions usual in this genus.

PLATE LXX. *Fig.* 1, portion of a stem of the *natural size*; 2, branch and ceramidia; 3, ceramidium; 4, longitudinal section of the same; 5, spores; 6, branch and stichidia; 7, stichidium; 8, sphærospores:—*magnified.*

2. POLYSIPHONIA *Lyallii*, Hook. fil. et Harv.; caule cartilagineo setaceo inarticulato alterne vel vage ramoso, ramis elongatis simplicibus inarticulatis ramulis brevibus articulatis quadrifariis multifidis densissime vestitis, ramulorum articulis diametro æqualibus 3–5 venosis. (TAB. LXXIV. Fig. I.)

HAB. Lord Auckland's group. (*Dr. Lyall.*)

Caulis erectus, 4–5 unc. longus, validus, simplex v. basi divisus; ramis paucis, elongatis, alternis v. secundis, simplicibus; caulis et rami inarticulati, densissime e basi ad apicem ramulis brevibus 1 lin. longis obsiti. *Ramuli* articulati, quadrifarii, patentissimi irregulariter multifidi, nunc fere dichotomi, alterne v. secunde partiti; ultimi subulati, acuti, patentes v. recurvi. *Articuli* 3–5-striati, diametro subæquales v. vix longiores. *Color* intense fusco-ruber. *Fructus* .... ? *Siphones* in ramis majoribus quatuor, magni, tubulum centralem angustum cruciatim cingentes, cellulis irregularibus peripheriam versus sensim minoribus circumdati.

We have much pleasure in naming this very distinctly marked and beautiful species after its discoverer, Dr. Lyall.

PLATE LXXIV. *Fig.* I.—1, plant of the *natural size*; 2, branch; 3, portion of stem; 4, ditto of branch:—*magnified.*

3. POLYSIPHONIA *dumosa*, Hook. fil. et Harv.; caule erecto rigido flabellatim ramoso inarticulato, ramis patentibus alternis v. subdichotomis elongatis, ramulis distantibus æqualibus brevibus patentissimis subdistichis laxe pinnatis subulatis, articulis ramulorum brevissimis. (TAB. LXXV. Fig. I.)

HAB. Campbell's Island; parasitic on the stems of large *Algæ*.

Caules cæspitosi, 1–3 unc. longi, erecti, cylindracei, basi simplices, sursum flabellatim ramosi v. irregulariter dichotome v. alterne divisi. *Rami* simplices v. divisi, per totam longitudinem ramulis 1–2 lin. longis, horizontali-patentibus subdistichis laxe pinnatis obsiti. *Pinnulæ* patentes, subulatæ, acutæ, strictæ, curvatæ v. tortæ. *Articuli* in ramulis tantum manifesti, brevissimi, 3–5-striati. *Siphones* ramulini quatuor, magni, tubulum centralem angustum cruciatim cingentes, cellulis irregularibus peripheriam versus sensim minoribus circumdati. *Color* badius, apices versus fusco-ruber. *Substantia* rigida.—Chartæ vix adhæret.

Allied to *P. Lyallii*, but much smaller in all its parts; of a duller colour and more rigid substance, differently branched and with less dense ramuli, which are nearly, though not strictly, distichous. In aspect, it somewhat resembles *P. ceratoclada*, though quite unlike that species in internal structure.

PLATE LXXV. *Fig.* I.—1, portion of a branch; 2, stem and branch; 3, section of stem:—*magnified.*

4. POLYSIPHONIA *punicea*, Mont.; punicea, caule vage ramoso articulato setaceo flexuoso, ramis alternis v. secundis subremotis, ramulis alternis remotiusculis flabellato-dichotomis abbreviatis patentissimis ultimis subulatis recurvis, articulis ramorum diametro 3–4-plo longioribus 3–5-venosis ramulorum subquadratis biveniis pellucidis apicibus acutis, "capsulis subsessilibus ovato-acuminatis" (Mont.), stichidiis lanceolatis sphærosporas pluriseriatas includentibus, ceramidiis sessilibus solitariis urceolatis, ore contracto porrecto. P. punicea, *Mont. Prodr. Phyc. Antarct.* p. 6. *Voy. au Pole Sud, Bot. Crypt.* p. 128. t. 5. f. 3.

Polysiphonia Lyallii.

P. rudis.

W.H.H.f. W.F.del.

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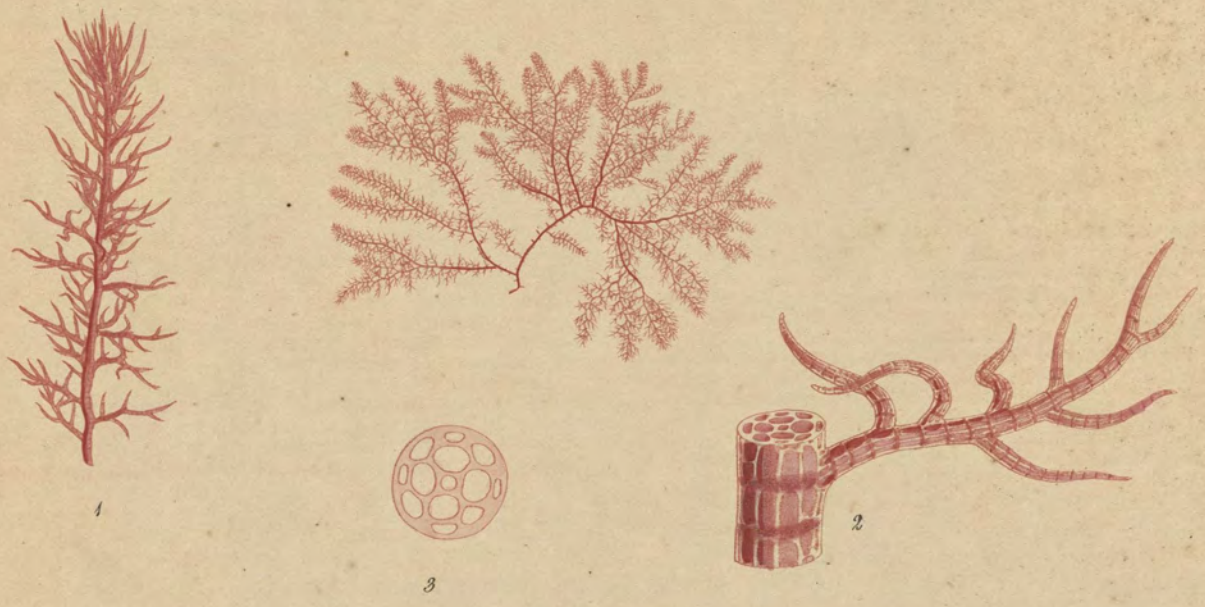
ASIATIC



Polysiphonia dumosa.

Pol: ceratoclada. Mont:

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J.D.H.&W. Fitch del.t

HAB. Lord Auckland's group; on the roots and stems of sea-weeds.

Caulis 4–8 unc. longus, setam porcinam diam. æquans, sursum attenuatus, subangulatim flexuosus, vage ramosus, nunc subsimplex, ramis lateralibus instructus, nunc e parte inferiore subdichotome divisus, articulatus, *Rami* inferiores longiores, superiores sensim abbreviati, simplices v. ramosi, patentes v. divaricati; ramulis abbreviatis, flabellatis, dichotomis, patentissimis, laxe quadrifariam insertis, ultimis subulatis divaricatis v. recurvis. *Articuli* caulis et ramorum majorum diam. 3–4-plo longiores, 4–5-striati, medio pellucide coccinei v. punicei, ad geniculos cellulis minutis superficialibus donati hinc opaci; ramulorum diam. vix longiores v. æquales, 2–3-striati. *Siphones* in ramis majoribus novem, tubulum centralem amplum radiatim cingentes, cellulis externis nullis; caules hinc sulcati. *Ceramidia* non visa. *Stichidia* lanceolata, sphærosporas magnas quadripartitas pluriseriatas includentia. *Substantia* tenera.—Chartæ adhæret.

Slightly variable in some minor characters, yet a distinctly marked and easily recognized species. Main branches irregular, being imperfectly dichotomous or having a simple stem furnished with lateral branches. The most striking specific character consists in the dichotomously multifid fan-like ramuli, which are set rather laxly along the branches. We have not seen ceramidia; several of our specimens produce stichidia, of the shape described by Montagne; but the sphærospores are in a double and occasionally a triple row, as in *Dasya*. In one individual, the ceramidia are replaced (by disease) with a cluster of sphærical bodies, forming a mass which resembles the favella of a *Callithamnion*, and, from which, fascicles of ramuli are given off in a proliferous manner. These call to mind the capsules of *P. botryocarpa*, and though their structure be very irregular, they suggest a doubt whether the remarkable fructification of the latter plant is not abnormal.

5. POLYSIPHONIA *rudis*, Hook. fil. et Harv.; pusilla, filis cæspitosis rigidis tenacibus gracilibus subfastigiatis ramosis, ramis alternis apicem versus crebrioribus inferioribus filiformibus nudis elongatis superioribus basi nudis apice pinnatis, pinnulis subulatis elongatis erectis, articulis ramorum diametro 2–3-plo ramulorum sesqui-longioribus 3–4-striatis. (TAB. LXXIV. Fig. II.)

HAB. Lord Auckland's group; parasitic on larger *Algæ*.

Caules dense cæspitosi, e filis intertextis orti, 1–1½ unc. longi, siccitate rigidi, madore tenaces, atro-fusci, vix rubescentes, indivisi. *Rami* inferiores erecti, elongati, simplices, filiformes, nudi; superiores sensim breviores, apices versus breviores, inferne nudi, superne pinnati, pinnis subulatis erectis inferioribus longioribus, hinc ramulis corymbosis. *Circumscriptio* ramorum obovata. *Articuli* per totam plantam manifesti, ramorum diametro 2–3-plo longioribus pauci-striatis, ramulorum sesqui-longioribus.

PLATE LXXIV. *Fig.* II.—I, a specimen of the *natural size*; 2, lower portion of branch and stichidia; 3, upper ditto; 4, a stichidium; 5, sphærospores:—*magnified.*

6. POLYSIPHONIA *ceratoclada*, Mont.; filo primario repente, caulibus erectis compressis indivisis demum ramos alternos emittentibus, ramis ramulisque brevibus subulatis patentissimis v. recurvis vestitis, ceramidiis sessilibus ovatis suburceolatisve, articulis brevissimis. P. ceratoclada, *Mont. Prodr. Phyc. Ant.* p. 6. *Voy. au Pole Sud, Bot. Crypt.* p. 130. t. 5. f. 2. (TAB. LXXVI. Fig. II.)

Var. β, *secundata*; ramis incurvis, ramulis plerumque secundis.

HAB. Lord Auckland's group; both varieties generally parasitical on *Laurencia pinnatifida*.

Tota ramulis subulatis obsita. *Caules* e filis repentibus *Algas* alias infestantibus, erecti, 1–4 unc. alti, compressi, in exemplaribus minoribus simplices, in majoribus ramis alternis cauli similibus donati. *Ceramidia* solitaria, ovata, lateralia, sessilia. *Stichidia* subulata, attenuata, sphærosporas uniseriatas foventia. *Substantia* rigidula. *Color* fusco-ruber.—Chartæ laxe adhæret.

The habit of this plant is precisely that of a *Polyzonia*; Montagne's specimens are in a young state, in which

simple stems, destitute of branches, and merely clothed with patent subulate ramuli, rise from creeping filaments; such individuals are from ½–1 inch high. But, when larger, lateral branches begin to be developed, in every respect similar to the main stem. In one specimen, 3½ inches long, which alone is in fructification, the branches are 1–1½ inch in length. The variety β is a remarkable one, and possibly a distinct species, it is smaller and slenderer, with the branches much curved and the ramuli very generally secund.

PLATE LXXVI. *Fig.* II.—1, portion of a branch; 2, the same with ceramidia; 3, section of stem; 4, ceramidium; 5, spores: *magnified.*

7. POLYSIPHONIA *decipiens,* Mont.; "cæspitosa, fragilissima, filis cylindraceis subcontinuis fusco-nigris irregulariter virgato-ramosissimis, ramulis erectis, spinis subulatis spiraliter alternis strictis, articulis diametro multoties brevioribus ex siccatione collapsis 3–5-venosis; fructu .... ?" Mont. *Prodr. Phyc. Antarct.* p. 5. *Voy. au Pole Sud, Bot. Crypt.* p. 131.

HAB. Lord Auckland's group. (*Admiral D'Urville.*)

8. POLYSIPHONIA *cladostephus,* Mont.; "filo primario articulato polysiphonio vage ramosissimo fusco-purpureo nigrescente, ramis conformibus e geniculis ramellos verticillatos dichotomos monosiphonios dense imbricatos emittentibus, fructu .... ?" Mont. *in Ann. des Sc. Nat.* (Nov. 1843), p. 39. *Voy. au Pole Sud, Bot. Crypt.* p. 132. t. 13. f. 4.

HAB. Lord Auckland's group. (*Admiral D'Urville.*)

Apparently nearly related to *P. byssoides,* Grev., and still more closely to *P. byssoclados,* Harv. (*Griffithsia australis,* Ag.)

15. JANIA, *Lamour.*

1. JANIA *Hombronii,* Mont., *Voy. au Pole Sud, Bot. Crypt.* p. 146.

HAB. Lord Auckland's group; on rocks in the sea, abundant.

What we take for Montagne's plant much resembles the *Corallina officinalis,* L.; we are not, however, well versed in these vegetables, which have only recently been skilfully investigated by Decaisne.

16. LAURENCIA, *Lamour.*

1. LAURENCIA *pinnatifida,* Lamour.; var. γ, *angusta.* Fucus *Turn. Hist. Fuc.* vol. i. p. 40.

HAB. Lord Auckland's group; on rocks in the sea.

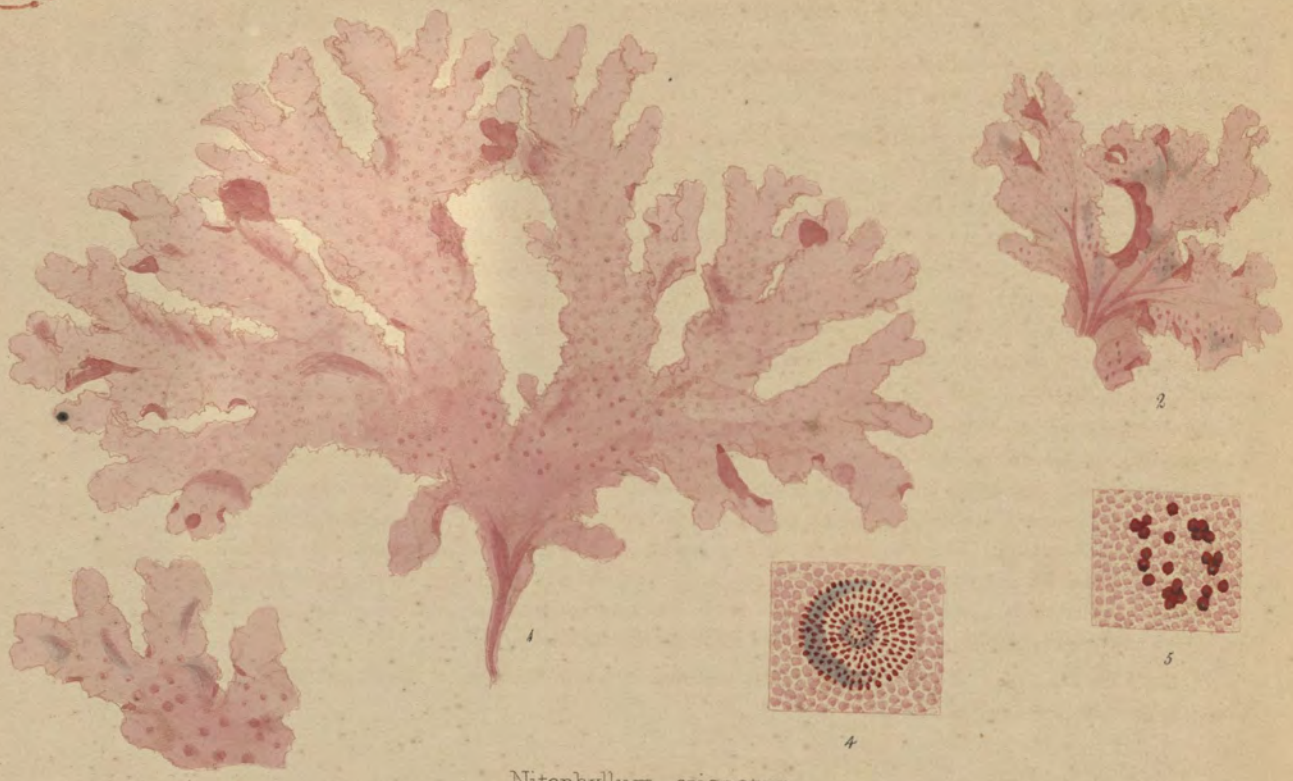
17. DELESSERIA, *Lamour.*

1. DELESSERIA *crassinervia,* Mont.; caule alato ramoso, foliis lineari-lanceolatis e costa valida proliferis, capsulis in costa sessilibus, soris sphærosporarum linearibus costæ parallelis. D. crassinervia, *Mont. Prodr. Phyc. Ant.* p. 1.

HAB. Lord Auckland's group and Campbell's Island.

We have some doubts as to the validity of this species, which differs from *D. Hypoglossum* only in the comparative breadth of its costa; a somewhat inconstant character, being, at times, excessively broad, covering nearly the whole lamina, at others, nearly, if not quite, as narrow as in *D. Hypoglossum.* These intermediate forms do not exist among our Campbell's Island individuals, but in those from the Falklands.

2. DELESSERIA *dichotoma,* Hook. fil. et Harv.; costa crassa dichotoma frondem cuneatam obtusam v. emarginatam demum bifido-laciniatam percurrente infra apicem evanida, frondibus e costa denudata orien-



Nitophyllum crispatum.

Delefseria dichotoma.

J.D.H & W.F. del.

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tibus oblongis cuneatis rariusve elliptico-lanceolatis costa furcata, soris rotundatis maculatis, coccidiis costalibus v. sparsis. (TAB. LXXI. Fig. II.)

HAB. Lord Auckland's group and Campbell's Island. (*Dr. Lyall.*)

Frons junior, folium obovatum, obtusum v. emarginatum, demum bilobum; costa furcata, demum repetito-dichotoma, deorsum crassa, sursum attenuata, sub apicem evanida. *Frondes* adultæ *caulis* furcatus v. dichotomus, 2–3 unc. longus, setæ porcinæ crassitie, nudus v. interruptim alatus, superne in frondes cuneatas v. dichotomas abeuns; inferne denudatus v. frondibus novis primordiali conformibus sed angustioribus minusque cuneatis ornatus, hæ 1½ unc. longæ, costis supra medium furcatis fructiferis. *Coccidia* in laminam rarius in costam sita, sphærica, sparsa, granulis cuneatis repleta. *Sori sphærosporarum* rotundati, supra laminam dispersi. *Substantia* membranacea. *Color* purpureo-roseus v. sanguineus.—Chartæ adhæret.

When fully grown, this species resembles a very broad and luxuriant state of *D. alata*, found in the north of Ireland, but differs essentially from it in its mode of growth. Judging by young specimens, it appears to originate in a broadly ovate or cuneate leaf, traversed by a forked, or, as the frond advances, repeatedly dichotomous midrib, which, though gradually evanescent, is obvious for nearly the whole length of the lamina, and thus differs from the imperfectly branching veins of the *Nitophylla*. In old and battered specimens, however, this character can only be detected in the young parts; in them, the costa of the first formed leaf becomes denuded, considerably thickened and converted into a dichotomous stem, irregularly winged in portions, and only preserving, on the upper part, the remains of its former character; while, all along its denuded portions, spring numerous new fronds, narrower than that which forms the principal one, and less cuneate, but in other respects similar.

PLATE LXXI. *Fig.* II.—1, 2, and 3, specimens in different states, of the *natural size*; 4 and 5, coccidia; 6 and 7, sphærospores:—*magnified.*

18. NITOPHYLLUM, *Grev.*

1. NITOPHYLLUM *crispatum*, Hook. fil. et Harv.; fronde basi nervosa cuneata latissime expansa v. oblonga dichotoma v. laciniata margine crispata, nervis ramosis, laciniis cuneatis apicibus axillisque obtusis, soris minutis rotundatis coccidiisque sparsis. (TAB. LXXI. Fig. I.)

HAB. Campbell's Island; dredged up in three fathoms water.

Two specimens, one with capsular, the other with granular fruit, we refer to this species. The capsuliferous specimen bears a very great resemblance to the north of Ireland variety of *N. laceratum*; the granuliferous, again, has more the oblong form of *N. punctatum*. Both agree in being traversed, especially in the lower part, with obscure dichotomous nerves, in having the margin crisped, and exhibiting a tendency to dichotomous division. The scattered granular fructification essentially distinguishes it from *N. laciniatum*, and the form and size of the spots, from *N. punctatum*.

PLATE LXXI. *Fig.* I.—1, 2, and 3, specimens of the *natural size*; 4, coccidia; 5, sphærospores:—*magnified.*

2. NITOPHYLLUM *punctatum*? Grev. *Alg. Brit.* p. 79. t. 12. *Agardh, Species Alg.* vol. i. p. 186. Aglaophyllum, *Montagne in Plant Cell. Canar.* p. 150.

HAB. Campbell's Island; with the former.

Decayed fragments, which appear to belong to this species, are all that were procured.

19. PLOCAMIUM, *Lyngb.*

OBS. The genera *Thamnophora* and *Plocamium* appear to differ in no respect from each other, and so perfectly

do they agree in habit, that plants regarded by the elder Agardh as varieties of *Pl. coccineum* (β and γ) are considered by his son as distinct species of *Thamnophora**.

1. PLOCAMIUM *coccineum*, Lyngb.; *Hydr. Dan.* p. 39. t. 9. *Grev. Alg. Brit.* p. 12. t. 98. *Hook. Brit. Fl.* vol. ii. p. 293. P. vulgare, *Lamour.* Pl. coccineum, fenestratum, Lyngbyanum, et Binderianum, *Kütz. Phyc. Gen.* p. 449 and 450.

HAB. Lord Auckland's group and Campbell's Island; abundant.

This is the only species of the genus found in the northern hemisphere and is apparently common, especially in all temperate regions of the globe.

20. RHODOMENIA, *Grev.*

1. RHODOMENIA *Hombroniana*, Mont.; "fronde cartilagineo-membranacea plana e basi substipitata dichotoma pinnatifissa, pinnis ob axillas obtusas patenti-erectis obtusis, margine fimbriato seu ramenta dentata conceptaculifera emittente, conceptaculis hemisphericis papillula instructis." *Mont. Prodr. Phyc. Antarct.* p. 1. *Voy. au Pole Sud, Bot. Crypt.* p.157 . t. 1. f. 2. (TAB. LXXII. Fig. II.)

HAB. Lord Auckland's group; on the stems of large *Algæ*.

Our specimens of this plant are young, and as they differ from the more advanced state in form and in colour, we have added a figure; the colour in this state is of a beautiful red purple, sometimes inclining to violet. When fully developed, the species assumes the appearance represented by Dr. Montagne in the plate quoted above. We are indebted for magnificent specimens, collected at Akaroa, to M. Raoul.

PLATE LXXII. *Fig.* II.—1. a young specimen, of the *natural size*; 2, 3 and 4, marginal leaflets bearing the fructification; 5, section of the same:—*magnified.*

2. RHODOMENIA *ornata*, Mont.; "fronde carnoso-membranacea oblongo-lanceolata latissima plana vivide purpurea utrinque margine prolifera, foliis s. pinnulis obovatis substipitatis tandem cuneatis maximis palmatifissis, conceptaculis per totam frondem sparsis." *Mont. Prodr. Phyc. Antarct.* p. 1. *Voy. au Pole Sud, Bot. Crypt.* p. 160. t. 11.

HAB. Lord Auckland's group. (*Admiral D'Urville.*)

The plant, from which the magnificent plate given by Montagne was executed, is marked by the lamented D'Urville as a native of Lord Auckland's Island, where, we regret to say, it was not collected by the Antarctic Expedition.

3. RHODOMENIA *dichotoma*, Hook. fil. et Harv.; fronde membranacea rosea basi cuneata latissima dichotoma, axillis rotundatis, laciniis patentibus linearibus v. cuneatis obtusis demum emarginatis et bifidis. (TAB. LXXII. Fig. I.

HAB. Campbell's Island; on rocks in the sea.

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* I had long supposed that the sphærospores of these genera were different; but after a complete examination of the fruit of *T. corallorhiza, costata, angusta, Mertensii, procera, Cunninghamii, Telfairiæ* and *cornuta*, and comparison with that of *Pl. coccineum*, I have been obliged to abandon this idea. In all, the sphærospores are cylindrical, divided into four by three transverse striæ. Kützing separates *Pl. cornutum* under the generic name of *Thamnocarpus*, but I am at a loss to conceive upon what grounds.—W. H. H.

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Rhodomenia dichotoma.

R. Hombroniana (young).

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Frons flabellatim expansa, 4–7 unc. lata, basi cuneata, pluries dichotoma, laciniis linearibus cuneatisve, $\frac{1}{4}$–$\frac{1}{2}$ unc. latis et ultra, patentibus, apicibus obtusis emarginatis bifidisve. *Substantia* tenuis, membranacea, e cellulis superficiem versus minimis coloratis formata, interioribus magnis hyalinis.—Chartæ non adhæret.

Our specimens of this plant are unfortunately barren, it resembles in outline the *Phyllophora obtusa*, but is of a very different consistence. Its nearest ally is the *R. Palmetta*, to gigantic specimens of which it may be compared.

Plate LXXII. *Fig.* I.—1. a specimen of the *natural size*; 2, lacinia of a specimen with narrower fronds, also of the *natural size*.

Dr. Montagne adds *R. corallina*, Grev., *R. variegata* (*Halymenia*, Bory), and *R. bifida*, Grev., as natives of Lord Auckland's group, but the specimens are imperfect and they may belong to some of the former.

21. HYPNEA, *Lamour.*

1. Hypnea *multicornis*, Mont.; "fronde filiformi tereti compressa inordinate corymboso-ramosissima, ramis ultimis subdistichis alternis aut subsecundis furcatis, ramulis patenti-recurvis hamulosis, pluribus apice conformi incrassatis sporophoris." *Mont. Voy. au Pole Sud, Bot. Crypt.* p. 153. t. 9. f. 1. Rhodomela, *Mont. Prodr. Phyc. Antarct.* p. 4.

Hab. Lord Auckland's group. (*Admiral D'Urville.*)

22. GRATELOUPIA, *Agardh.*

1. Grateloupia? *Aucklandica*, Mont.; "fronde cartilaginea filiformi tereti vage ramosissima, ramis ramentisque confertis fasciculatisque subcompressis basi attenuatis sæpius ex insigni frondis tuberculo singulis pluribusve enatis, fructu . . . . ?" *Mont. Prodr. Phyc. Antarct.* p. 7. *Voy. au Pole Sud, Bot. Crypt.* p. 15. t. 10. f. 1.

Hab. Lord Auckland's group. (*Admiral D'Urville.*)

23. PHYLLOPHORA, *Grev.*

1. Phyllophora *obtusa*, Grev.; fronde corneo-membranacea stipitata basi longe cuneata enervi flabelliformi subdichotome laciniata, laciniis latissimis valde obtusis axillis acutis, coccidiis stipitatis sporophyllisque e frondis pagina ortis aggregatis. P. obtusa, *Grev. in Wern. Trans.*

Hab. Lord Auckland's group; on shells, &c., in the sea.

Radix scutata, parva, parce fibrosa. *Frondes* aggregatæ, 6–14 unc. longæ, basi cuneatæ, in stipitem filiformem attenuatæ, 1–1$\frac{1}{2}$ unc. longæ, alterne dichotome fissæ v. palmatæ, simplices v. furcatæ, valde obtusæ, axillis angustis acutis. *Coccidia* pedicellata, in soros elongatos laciniarum paginam occupantes aggregata, globosa, pedicello filiformi v. foliaceo. *Sporophylla* aggregata, rotundata, sphærosporas minutas foventia. *Substantia* siccitate rigide membranacea v. cornea, subtranslucens. *Color* amæne roseus.

The Auckland's group specimens are small and barren, but agree entirely with those of the Cape of Good Hope, from which in part the preceding description has been prepared.

24. GIGARTINA, *Lamour.*

1. Gigartina *divaricata*, Hook. fil. et Harv.; caule cartilagineo-carnoso compresso lineari subdichotome diviso, ramis distichis pinnatis subpinnatisve, ramulis patentissimis linearibus subattenuatis.

Hab. Campbell's Island; thrown up on the beach.

Caulis 4–6 unc. longus, subdichotome divisus, 1–2 lin. latus, compressus, strictus, ramis subquadrifariis distichisve dense obsitus. *Rami* divaricati, stricti, compressi, rugulosi, nudi, parce pinnati v. subbipinnati, apicibus longe nudis. *Pinnulæ* horizontales, breves, simplices v. furcatæ, lineares, acutæ, nunc abbreviatæ et spiniformes. *Color* lividus v. nigro-rubescens, ad apices ramulorum pallidior purpurascens. *Substantia* cartilagineo-carnosa, firma, elastica, siccitate valde contracta.—Chartæ non adhæret.

Our specimens are imperfect and barren, but sufficient to prove them to be a very distinct species of *Gigartina*. The whole plant is very elastic, shrinking much in drying; internally it is composed of a dense body of anastomosing filaments, radiating towards the circumference through a firm gelatine.

G. pistillata, Lam., is also enumerated in Montagne's account of Lord Auckland's Island.

25. NOTHOGENIA, *Mont.*

1. Nothogenia *variolosa*, Mont. *in Ann. Sc. Nat.* Series 2. vol. xx. p. 302. t. 10. f. 3. Chondrus variolosus, *Mont. Prodr. Phyc. Antarct.* p. 6. *Voy. au Pole Sud, Bot. Crypt.* p. 110.

Hab. Lord Auckland's group; on rocks in the sea, abundant.

Frondes cæspitosæ, 4–5-unciales, anguste lineares, 1–1½ lin. latæ, compressæ, planæ v. subcanaliculatæ, basi cuneatæ, superne pluries dichotomæ, laciniis basi angustatis, ultimis elongatis obtusis v. emarginatis ½–1 unc. longis. *Conceptacula* per totam laciniarum supremarum, immersa, convexa, verrucæformia, poro pertusa, utraque frondis pagina sparsa. *Substantia* cartilaginea. *Color* fusco-ruber, purpurascens.—Chartæ laxe adhæret.

26. CHONDRUS, *Stack.*

1. Chondrus *tuberculosus*, Hook. fil. et Harv.; fronde cartilaginea basi cuneata late lineari furcata v. ter quaterve dichotoma plana v. canaliculata, laciniis patentibus obtusis, axillis rotundatis, verrucis sphæroideis pagina frondis superiore extantibus medio depressis demum pertusis massam densam sporarum rosearum includentibus.

Hab. Lord Auckland's group; on rocks in the sea.

Frons 2-uncialis, basi simplex, superne plus minusve furcata, margine simplici pinnulisve ornata. *Laciniæ* planæ v. pagina superiore canaliculata, patentes v. divaricatæ, sursum latiores, obtusæ. *Coccidia* v. *verrucæ* numerosissima, magnitudine seminis Brassicæ, globosa, latere concavo frondis sita, extantia, rarius pagina frondis immersa, basi constricta, apice depressa v. umbilicata, siccitate apotheciam *Lichenis* referentia, demum pertusa. *Sporæ* minutæ. *Substantia* crassa, carnoso-cartilaginea, siccitate valde contracta. *Color* lividus.—Chartæ laxe adhæret.

Apparently a distinct species. Smaller than *Noth. variolosa*, but broader, less frequently dichotomous and with very different fructification. The coccidia? are situated on one side of the frond, prominent, constricted at the base and contain a large dense spherical mass of sporules, similar to those of the differently shaped warts of *Chondrus crispus*. The shape of the fruit is that of *Iridæa Radula* or *stiriata*, and when dried under pressure it resembles the apothecia of a *Collema*.

27. IRIDÆA, *Bory.*

1. Iridæa *Radula*, Bory, *in Duperrey Voy. Bot. Crypt.* p. 107. *Grev. Alg. Brit.* p. 61. Sphærococcus Radula, *Agardh, Sp. Alg.* vol. i. 268. Fucus Radula, *Hb. Banks, Esper*, t. 113. Fucus bracteatus, *Gmel., Turn.* t. 25. Mastocarpus Radula, et Chondrodictyon Capense, *Kütz. Phyc. Gen.* p. 396 and 398.

Hab. Lord Auckland's group and Campbell's Island; very abundant on rocks in the sea.

Radix scutata, fibris comitata. *Caulis* 1–2 unc. longus, basi cylindraceus, crassitie pennæ corvinæ, mox compressus, superne dilatatus, divisus v. ramosus. *Frondes* basi rotundatæ, cuneatæ v. attenuatæ, ellipticæ lanceolatæve,

Halymenia latifsima.

J.D.H. & W.F. del.

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6–20 unc. longæ, rarius bi-tripedales, crassæ, simplices v. furcatæ v. ad basin bipartitæ, nunc margine frondes accessorias emittentes, interdum poris perplurimis pertusæ. *Superficies frondis* lævis, lucida, adulta papillosa; papillis creberrimis, tandem totam frondem utrinque vestientibus, apice fructiferis, favellidia immersa poro pertusa gerentibus. *Sporæ* minutæ, roseæ, densissime aggregatæ. *Sphærosporæ* frondibus papillarum destitutis immersæ, substrato corticali sitæ, in globulis minutis punctiformibus aggregatæ, totam frondem pustulantes. *Substantia* crassa, carnosa. *Color* lividus, rubescens purpurascensve, raro atro-sanguineus.

There is scarcely a maritime rock on the Antarctic coasts, that does not abound with this most protean species in all stages of growth, and bearing fronds with every variety of outline. It is much eaten by marine animals, and from this or other causes, amongst which may be reckoned the fall of the fructiferous papillæ, the plant is frequently found more or less perforated with round holes, sometimes so regularly as to resemble coarse lace: this state has been described by Kützing, under the name of *Chondrodictyon Capense*, and by Decaisne as *Iridæa clathrata* (Ann. Sc. Nat. Ser. III. vol. ii. p. 236). More puzzling is the form of the secondary fructification or sphærospores, which is so like a primary fruit, that had not both Mr. Harvey and myself seen this plant growing on its native rocks, we should have supposed the individuals producing them to belong to a different species. The secondary fruit of *I. stiriata* is of the same nature.

The *I. micans*, Bory, *volans*, Grev., and *laminarioides*, Bory, enumerated by Montagne as natives of Lord Auckland's group, are probably states of this.

28. HALYMENIA, *Agardh.*

1. Halymenia *latissima*, Hook. fil. et Harv.; fronde plana tenui gelatinoso-membranacea latissime ovato-lanceolata simplici bifida v. margine laciniato-pinnatifida, laciniis ovato-lanceolatis acutis. (Tab. LXXIII.)

Var. β, *bifida*; fronde lanceolata basi attenuata bifida v. bifurcata, laciniis lanceolatis erectis.

Hab. Lord Auckland's group and Campbell's Island; both varieties abundant on rocks in the sea.

Frondes 2–14 unc. longæ, 4–6 latæ, tenues, basi cuneatæ, late lanceolatæ v. ovato-oblongæ, acutæ, simplices v. furcatæ, margine plano simplici integerrimo v. laciniis plurimis subpinnatifido. *Substantia* gelatinosa. *Favellidia* numerosissima, per totam frondem sparsa, cellulis medullaribus immersa. *Color* amæne roseus.

We offer this as a new species with some doubt, the varieties of *H. ligulata* approaching it. The fronds are so broad and thin, that the favellidia form convexities on its surface, which are more or less obliterated when moist.

Plate LXXIII. *Fig.* 1, portion of the surface of the frond; 2, section of the same; 3, spores:—all *magnified.*

29. DUMONTIA, *Lamour.*

1. Dumontia *filiformis*, Grev., *Alg. Brit.* p. 165. t. 17. Halymenia, *Agardh Spec. Alg.* vol. i. p. 214.

Hab. Campbell's Island. (*Dr. Lyall.*)

Identical with the European plant. Found also at the Cape of Good Hope and in other widely separated localities.

2. Dumontia *cornuta*, Hook. fil. et Harv.; fronde tubulosa hic illic inflata divisa, parte inferiore nudiuscula superiore ramis confertis fasciculatisve quadrifariis vestita, ramis furcatis patentibus flexuosis alternatim ramulosis, ramulis recurvis utrinque attenuatis apicibus acutis.

Hab. Campbell's Island. (*Dr. Lyall.*)

Frondes cæspitosæ, 2–3 unc. longæ, tubulosæ, irregulariter inflatæ, 2 lin. latæ, vage divisæ; ramis intricatis, patentibus, flexuosis, furcatis; ramulis fusiformibus, patentibus v. recurvis. *Color* fuscatus, badius v. rubescens.

Our specimens of this plant are barren; we refer it to *Dumontia* from the tubular inflated frond, structure, and habit.

30. BALLIA, *Harv.*

1. Ballia *Brunonis*, Harv., *in Hook. Journ. of Bot.* vol. ii. p. 191. Sphacelaria callitricha, *Agardh Ic. Alg. Europ.* t. 6. Ballia callitricha, *Mont. Voy. au Pole Sud, Bot. Crypt.* p. 94.

Var. β, *Hombroniana*. B. Hombroniana, *Mont. Prodr. Phyc. Antarct.* p. 9. *Voy. au Pole Sud, Bot. Crypt.* p. 95. t. 12. f. 1.

Hab. Lord Auckland's group and Campbell's Island; on the roots and stems of large *Algæ*, abundant.

Caulis in exemplaribus Aucklandicis 2 unc. altus, seta porcina duplo crassior, hirtus, vage ramosus, di-trichotomus; ramis primariis apice flabellatim ramulosis, circumscriptione rotundatis, fastigiatis, 3–5 lobatis. *Ramuli* bi-tripinnati, pinnulis subremotis acutis. *Articuli* pinnarum diametro duplo vix triplo longiores, ovato-oblongi, rarius cylindracei, apice angustati, pinnularum sesqui-longiores, ovati. *Substantia* rigida, cornea. *Color* purpureo-roseus.

The Auckland's group specimens appear to belong chiefly to the *B. Hombroniana* of Montagne, a native of Akaroa*, on the middle island of New Zealand; they differ from those of Tasmania and the Falklands in being shorter and of a denser habit, in having longer articulations to the pinnæ and pinnulæ, and in the latter being generally only twice pinnated, with the ultimate pinnules separated and remote, like the teeth of a comb. Kerguelen's Land individuals connect these forms. We have examined several hundreds of specimens, from seven or eight different localities in the Antarctic Ocean, without being able to trace any constant specific distinction amongst them; the same individual often bears both bipinnate and tripinnate fronds, with the segments remote or approximated; the length of the articulations and their form, and the outline of the branches from broadly ovate to linear-lanceolate are equally variable characters. We can, however, well understand Montagne's drawing a different conclusion from an examination of but few specimens of the extremes.

31. PTILOTA, *Agardh.*

1. Ptilota *formosissima*, Mont., caule ancipiti compresso costa articulata percurso vage ramoso decomposite pinnato, pinnis valde inæqualibus pinnulisque alternis patentibus ultimis serratis, favellis sessilibus, involucri foliis pinnatifidis, sphærosporiis marginalibus pedicellatis. Pt. formosissima, *Mont. Prodr. Phyc. Ant.* p. 8. *Voy. au Pole Sud, Bot. Crypt.* p. 98. t. 9. f. 3. (Tab. LXXVII.)

Hab. Lord Auckland's group; abundant.

Radix callus exiguus. *Frondes* aggregatæ, 6–10 unc. longæ, 4–6 latæ, flabelliformes. *Caulis* (*jugamentum* Ag.) basi teres, mox plano-compressus, linearis v. utrinque subattenuatus, $\frac{1}{2}$–$1\frac{1}{2}$ lin. latus, distiche ramosissimus. *Pinnæ* $\frac{1}{4}$ unc. longæ, alternæ, pinnatæ v. bipinnatæ; pinnulis brevibus, alternis, patentibus, serratis v. pectinatis, apice subacutis. *Favellæ* sessiles, involucro quadrifoliato pectinato cinctæ, sphæricæ, sporis minutis angulatis farctæ. *Sphærosporæ* marginales, pedicellatæ, globosæ, demum 4-partitæ. *Color* amæne puniceus. *Substantia* cartilaginea, firma.—Chartæ laxe adhæret.

We have numerous specimens of this magnificent plant in the most perfect state of fructification. The favellæ, involucred with four regularly pectinated bracteæ, are striking objects under the lens. The stem is not strictly articulate, in our specimens at least, but traversed by a strong raised articulated mid-rib, most evident on the old frond and occupying one-third of the breadth of the stem. The surface cellules, like those of other parts of the frond, are minute, but internally divided by transverse diaphragms into a series of cells full of gelatine, whose walls are formed of jointed fibres.

* "Insula Leyden, Batavia," is also given as a habitat (in Voy. au Pole Sud) probably erroneously, for the genus has not hitherto been found to the northward of the 40th degree of south latitude.

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Ptilota formosissima Mont:

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PLATE LXXVII. *Fig.* 1, favella *in situ*; 2, the same removed with the involucre laid open; 3, sphærospores:—*magnified.*

32. CERAMIUM, *Adans.*

1. CERAMIUM *rubrum*, var. γ, *secundatum*, Agardh, *Sp. Alg.* p. 149. Cer. secundatum, *Lyngb. Hydr. Dan.* t. 37.

Var. ε, *tenue*, Agardh, *Sp. Alg.* vol. ii. p. 149.

HAB. Lord Auckland's group and Campbell's Island; both varieties abundant.

2. CERAMIUM *diaphanum*, Agardh, *Sp. Alg.* vol. ii. p. 150.

Var. β, *Aucklandicum*, proliferum, articulis brevibus.

HAB. Lord Auckland's group; not common.

Apparently a curious state of the *C. diaphanum*.

3. CERAMIUM *cancellatum*, Agardh, *Sp. Alg.* vol. ii. p. 145.

HAB. Lord Auckland's group; parasitic on other seaweeds, rare.

Our specimen entirely agrees with others collected at the Cape of Good Hope, and with the description of Agardh; it is doubtful, however, whether all may not be varieties of *C. obsoletum*, Ag., from which they differ mainly in the more branched and less virgate habit. One of our South African specimens is so repeatedly branched, as eminently to justify Agardh's character, "ramis distichis multifidis quasi cancellatis;" that from Lord Auckland's group is taller and the extreme divisions alone retain that character; neither of these are more than four inches long; we have, however, much larger examples, in which it is wholly lost. The station of Agardh's *C. cancellatum* is dubious, and his comparison of it with a plant brought from the Cape of Good Hope by Gaudichaud, renders it very probable that the Southern Ocean is its place of growth.

33. GRIFFITHSIA, *Agardh.*

1. GRIFFITHSIA *setacea*, Ag.? vol. ii. p. 129.

HAB. Lord Auckland's group.

Our young and mutilated specimens of what we refer to *G. setacea* are not sufficient for a satisfactory determination of the species. The articulations are rather narrower than in the European plant, but they do not otherwise differ.

34. CALITHAMNION, *Lyngb.*

1. CALITHAMNION *gracile*, Hook. fil. et Harv.; filo primario repente ramoso, caulibus erectis laxe bitripinnatis, pinnis remotis valde elongatis, pinnulis brevibus alternis erecto-patentibus simplicibus v. apice ramulosis, articulis primariis diametro 4–5-plo, secundariis sub 3-plo longioribus.

HAB. Campbell's Island; dredged up in four fathoms water.

Fila 1–2 unc. longa, gracillima, e fibrillis repentibus ramosis orta, laxe irregulariter alterne rarius opposite pinnatim divisa. *Sphærosporæ* sessiles, minutæ, sphæricæ. *Favellæ* ignotæ. *Articuli* pellucidi. *Color* roseus. *Substantia* tenera.

2. CALITHAMNION *pectinatum*, Mont.; "microscopicum, filo primario repente pinnis pinnulisque oppo-

sitis patentibus, articulis cylindraceis diametro duplo longioribus aut æqualibus, sphærosporis axillaribus." *Mont. Prodr. Phyc. Ant.* p. 9. *Voy. au Pole Sud,* p. 90.

Hab. Lord Auckland's group; creeping on other *Algæ*. (*Admiral D'Urville.*)

3. Calithamnion *hirtum,* Hook. fil. et Harv.; caulibus nigrescentibus intertextis, primariis robustis basi venosis continuis hirtis apice articulatis, secundariis elongatis ramulis pinnatis quadrifariis densissime vestitis, pinnulis simplicibus incurvis obtusis, articulis diametro sesqui-longioribus. (Tab. LXXVIII. Fig. II.)

Hab. Lord Auckland's group; parasitic on other seaweeds.

Caules cæspitosi, fibris intertextis basi comitati, 2–3 unc. longi, robusti, vage quadrifariam ramosi, per totam longitudinem ramulis quadrifariis densissime velati. *Rami* cauli similes, longitudine varii; *ramuli* inferiores breves caulibus habitum hirtum funalemve impertiunt, superiores longiores et pinnati evadunt; secundarii (v. plumulæ) pinnati, pinnis alternis erecto-patentibus elongatis obtusis incurvis, rachide flexuosa. *Color* atro- v. fusco-ruber. *Sphærosporæ* sphæricæ, solitariæ, latere interiore ramuli affixæ, pusillæ. *Substantia* rigidiuscula.—Chartæ adhæret.

In habit this approaches the *C. tetricum,* but after a careful comparison both with that and with *C. Arbuscula,* which it also resembles, we are convinced that it is distinct from either. The plumules are very different from those of the former species and larger than in the latter. It is not likely to be confounded with any other species.

Plate LXXVIII. *Fig.* II—1, a plant of the *natural size*; 2, branch; 3, ultimate pinnule; 4, portion of the same:—*magnified.*

4. Calithamnion *micropterum,* Hook. fil. et Harv.; parvum, erectum, caule articulato parce ramoso, ramis distichis alternis circumscriptione obovatis obtusis bi-tripinnatis, pinnis alterne multifidis flexuosis, pinnulis erecto-patentibus obtusis, articulis caulis ramorumque diametro 2–3-plove longioribus, ramulorum diametro aquantibus, sphærosporis sessilibus solitariis ellipticis.

Hab. Lord Auckland's group; parasitical on *Ptilota formosissima.* (*Dr. Lyall.*)

Radix scutata. *Caulis* subsolitarius, 2–3 lin. longus, erectus, parce distiche et alterne divisus. *Rami* basi pinnis simplicibus ornati, superne bi-tripinnati, nunc pinnulis alterne multifidis ut in *C. tetragono. Ramuli* alterni, inferiores simplices, superiores iterum divisi. *Articuli* pellucidi, rosei, venis destituti. *Sphærosporæ* minutæ, ramulis sparsæ, appressæ, ellipticæ, massam quadrifidam includentes. *Color* pulcherrime roseus. *Substantia* tenera.

This does not belong to the parasitical section of the genus typified by *C. Daviesii,* but rather resembles some of the larger species, as *C. tetragonum,* to which, in the form of the joints, the disposition, shape and relative size of the sphærospores, it is closely allied.

35. CONFERVA, *Agardh.*

1. Conferva *Pacifica,* Mont., *Prodr. Phyc. Antarct.* p. 16. *Voy. au Pole Sud, Bot. Crypt.* p. 7.

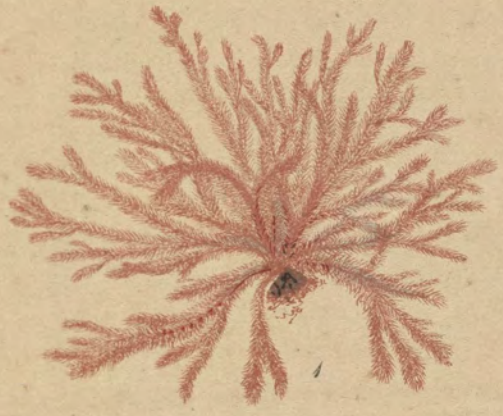
Hab. Lord Auckland's group; on rocks in the sea, very abundant.

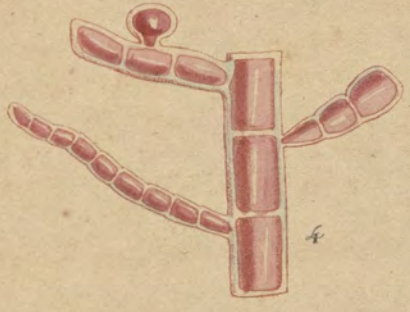
Cæspites 3–4 unc. longi, vage funiculari-divisi, e filis gracilibus intricatis læte virentibus compositi. *Fila* ramosissima; ramis inferioribus irregulariter ramosis, ramulos radiciformes hic illic emittentibus, superioribus vage ramosis dichotomis v. secundis, ramulis erectis, supremis appressis elongatis strictis. *Articuli* partis inferioris breves, diametro 2–3-plove longiores, superiores sensim elongati, ramulorum supremorum longissimi. *Color* læte viridis, nitens. *Substantia* membranacea.—Chartæ adhæret.

This species is nearly related to the *C. arcta* of Europe, to some varieties of which, especially that called *C. centralis,* it bears a very close resemblance.

The *C. virgata,* Ag., is enumerated by Montagne in his Flora of the 'Voy. au Pole Sud.'

Cal: gracile.





C. hirtum.

J.D.H & W.F. del.t

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2. Conferva *verticillata*, Hook. fil. et Harv.; cæspitosa, filis gracillimis strictis parum divisis, ramis lateralibus simplicissimis longissimis erectis strictis oppositis ternis quaternisve, articulis fili primarii diametro multoties, ramorum quadruplo, longioribus pellucidis.

Hab. Lord Auckland's group; on rocks in the sea, very abundant.

Fila tenuissima, 4 unc. longa, rigidula, simplicia v. parum divisa, erecta, stricta, ramis lateralibus ornata. *Rami* sæpius terni quaternive, verticillati, rarius bini, rarissime alterni, longissimi, filo primario longiores, erecti, strictissimi, simplices, ramulis omnino destituti, apice sphacelati. *Articuli* fili primarii diametro 7–8-plo longiores, clavati, geniculis nodosis, ramorum cylindracei diametro 3–4-plove longiores. *Color* siccitate luride viridis, opaca; planta vivente pallida, subhyalina.—Chartæ laxe adhæret.

Very nearly allied to *C. flagelliformis*, Suhr, a native of the Cape of Good Hope, agreeing with that plant in the remarkable ramification, but differing in the more slender habit, not being one half the diameter, and in having much larger articulations, especially on the main threads, which are singularly clavate with swollen joints, a character we do not observe in any states of *C. flagelliformis*. It cannot be confounded with any other species of the genus.

36. CODIUM, *Stack.*

1. Codium *tomentosum*, Stack., *Grev. Alg. Brit.* p. 185. t. 19. *Hook. Br. Fl.* vol. ii. p. 318. *Mont. in Voy. au Pole Sud, Bot. Crypt.* p. 35.

Hab. Lord Auckland's group; very abundant.

Equally abundant in the Antarctic as in the Northern Seas. Montagne gives the *C. adhærens*, Ag., as a native of this group.

37. ULVA, *L.*

1. Ulva *latissima*, Linn., *Flor. Suec.* no. 1159. *Mont. Voy. au Pole Sud, Bot. Crypt.* p. 33.

Hab. Lord Auckland's group and Campbell's Island; most abundant.

The *U. reticulata*, Försk., is mentioned by Montagne as a native of this group.

38. PORPHYRA, *Agardh.*

1. Porphyra *capensis*, Kützing.

Hab. Lord Auckland's group and Campbell's Island; on rocks in the sea.

This differs from the European *P. vulgaris* in the rigid texture of the frond, which is not always simple in the Cape of Good Hope specimens. The *P. columbina*, Mont., appears to be the same plant.

39. SCHIZONEMA, *Agardh.*

1. Schizonema *crispum*, Mont.; "filis cæspitosis viridibus crispatissimis apice penicillato-ramosis, ramis obtusis, cymbellis subparallelogrammis." *Mont. Prodr. Phyc. Antarct.* p. 16. *Voy. au Pole Sud, Bot. Crypt.* p. 2.

Hab. Lord Auckland's group; on the fronds of the smaller *Algæ*.

We have observed what we take to be this species, together with an *Achnanthes* and several other imperfect *Diatomaceæ*, upon *Ptilota formosissima* and some of the filamentous *Algæ*, amongst which is probably the *Achnanthes brevipes*, Ag.

XXXVII. LICHENES,* *L.*

(By Dr. Thomas Taylor and J. D. Hooker.)

1. USNEA, *Ach.*

1. Usnea *plicata*, Ach., *Syn. Lich.* p. 305. *Engl. Bot.* t. 257. *Schærer Lich. Helv.* no. 401.

Var. β, *hirta*, Ach. l. c. *Schærer*, no. 399.

Hab. Lord Auckland's group and Campbell's Island; both varieties, abundant.

The variety β, in Lord Auckland's group, is evidently the original plant, from which the *U. hirta* varies, and both are undoubtedly forms of *U. florida*; the latter, in its ordinary fruiting state, does not attain a high northern or southern latitude, being replaced by the *U. melaxantha*, which almost reaches the limits of Antarctic vegetation. We have little hesitation in affirming (with the author of the British Flora) that not only all the English species of *Usnea* are different aspects of one plant; but also that it is the only individual of the genus which we know to inhabit the temperate and warm parts of the globe.

2. Usnea *barbata*, Ach., *Syn. Lich.* p. 306.

Var. β, *sulphurea*; pallide straminea v. sulphurea.

Hab. Lord Auckland's group and Campbell's Island; the var. β only, but abundant.

This differs from the European plant in no respect but its pale sulphur or lemon colour; it is plentiful throughout Tasmania, Fuegia, and the Falkland Islands, and is decidedly a state of *U. hirta* β, hardly distinguishable from *U. hirta* itself, as the most casual observation in these islands will prove. It is often detached from its original place of growth, and, being carried by the winds over the barren hills, is found in great abundance, sticking to low bushes and even to the rigid shrubby thallus of *U. melaxantha*, in Fuegia and the Falklands. Some of the slenderest states are with difficulty to be discriminated from the genus *Cornicularia*, the filaments being brittle and the central thread not very apparent.

2. RAMALINA, *Ach.*

1. Ramalina *inflata*, Hook. fil. et Tayl.; thallo in cæspitem orbicularem congesto pallide flavo v. albido dichotome ramoso fistuloso turgido submembranaceo intus vacuo, lobis fistulosis intus stuppeis nunc foraminulosis ultimis acuminatis, apotheciis substipitatis concavis, disco concolore pruinoso, margine inflexo integerrimo. Cetraria inflata, *nobis, in Hook. Lond. Journ. of Bot.* vol. iii. p. 646. (Tab. LXXIX. Fig. I.)

Hab. Lord Auckland's group; on rocks near the sea.

Planta cæspitosa, albida, siccitate rigidiuscula, madore flaccida, membranacea, pellucida, brunneo picta. *Thallus* e basi subscutata ramosissima, 1–2-uncialis, cavus, inflatus, paulo compressus; ramis erectis, sub 3–4 lin. latis, fistulosis, sublacunosis, raro pertusis, intus vacuis v. parce stuppeis, extus lævibus, ramulis alternis angustatis. *Apothecia* lateralia v. terminalia, oblique inserta, stipite brevi; disco planiusculo, sub 3 lin. lato, concolori v. fusco-pruinoso;

* In arranging these species of a most variable Order of plants, the *Synopsis* of Acharius is followed, because it appears to us the more natural. That the precise plant referred to, under his name, may be the better understood, we have cited two works, which seem particularly worthy of attention, from the discrimination which the authors have shewn in selecting a variety of forms; these are the 'Lichenes Helveticæ' of M. Schærer, and the 'Stirpes Cryptogamicæ Voges. Rhenan.' of Mougeot and Nestler.

BRANCH OF THE ASIATIC SOCIETY

I.

Ramalina inflata.

II.

Stereocaulon Argus.

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excipulo thallode crassiusculo; margine integerrimo, primum inflexo; sporis 4–8 in quoque asco, oblongis, utrinque obtusis, linea transversa medio notatis.

Mr. Churchill Babington has pointed out to us the affinity of this species with the *R. pusilla*, Prev. (Fries, Lich. Eur. p. 29), a native of the Isles Hyères in the Mediterranean Sea. Of this plant we possess no specimens, and from the description the only points of difference seem to lie in the greater size of the present, which has the apothecia more separated from the thallus and are plane instead of concave. It is also a native of Tasmania.

The *R. geniculata*, nob. (in Lond. Journ. of Bot.), is allied to the present species in its fistulose thallus, but is much smaller and very differently branched. A third congener, or perhaps the true *R. pusilla*, is a native of Tasmania. The other species inhabiting the southern regions, are *R. ovata*, *verrucosa*, and *terebrata*, all allied to, and perhaps varieties of, *R. scopulorum* itself, in many cases almost undistinguishable from *R. fraxinea* and *fastigiata*.

PLATE LXXIX. *Fig.* 1, a specimen of the *natural size*; 2, an older state of the same; 3, portion of ramulus and apothecium; 4, section of apothecium; 5, portion of lamina proligera; 6, ascus; 7, spores:—*more or less magnified.*

3. SPHÆROPHORON, *Ach.*

1. SPHÆROPHORON *tenerum*, Laurer, *in Linnæa*, vol. ii. p. 45. t. 1. f. 4. S. australe, *nobis, in Hook. Lond. Journ. of Bot.* vol. iii. p. 654.

Var. β, *curtum*; S. curtum, *nobis, in Lond. Journ. of Bot.* vol. iii. p. 654.

HAB. Lord Auckland's group and Campbell's Island; on the ground in turfy places; β, in more elevated situations.

Laurer's description of this species is very characteristic, though drawn up from a small state of the plant, the apothecia not being always small, but sometimes even a line in diameter, they terminate in nearly erect, stout, solid, naked, terete branches, are hemispherical, broader than the branch which bears them; in the adult state margined only with the remains of a thallodal border, which afterwards falls away entirely. This is the decisive mark between all forms of *S. tenerum* and *S. corallinum*, for the colour varies from a rich brown to white and pink. It is an abundant Australian and Fuegian species.

2. SPHÆROPHORON *australe*, Laurer, *in Linnæa*, vol. ii. p. 44. S. insigne, *Laurer*, l. c.

HAB. Lord Auckland's group.

I am indebted to Mr. Churchill Babington for an authentic specimen of this beautiful species. In the normal state it differs widely from *S. compressum*, the whole frond being plane, branched in a palmate manner, repeatedly and dichotomously divided, with all the divisions divaricating and spread out like a fan, slightly convex above, there smooth but hardly shining, pale olive-green or yellowish; underneath, it is plane or slightly convex, more rugose and white; the ramuli of the oldest states are often transversely cracked or articulate; others again, and especially the Tasmanian specimens, are membranaceous and buff-coloured, wholly unlike any other aspect hitherto observed in the genus. In alpine specimens, growing with *Leptostomum inclinatum*, which bear fruit abundantly, the apothecia are large, covered with a thin, buff-coloured membrane, fixed wholly to the underside of the frond, which appears prostrate and branched beyond it. From Lord Auckland's group and Campbell's Island we have several varieties of this plant; 1. The thallus quite plane, repeatedly dichotomously branched, grey above, white beneath, powdered with minute black soredia (or abortive apothecia), the apothecia rare, small, nearly terminal on the under surface of the frond. 2. Thallus short, pale yellow, densely tufted, with the ultimate branches broader and truncate; always barren. 3. Thallus short, less divided especially below, white, pale greenish-yellow or pink; ultimate branches very short, thin, their apices everywhere tipped with abortive apothecia. 4. Branches few, broader, stouter; apothecia large. This is the ordinary fruiting state of the plant in these islands, and some specimens cannot be distin-

guished from the figure in English Botany of *S. fragile* (t. 114.), *S. compressum*, Ach., whence it comes to be a doubt whether if we consider this, the fruiting, as the ordinary state of the plant, all should not merge into *S. compressum*, itself a variety of *S. corallinum*; against which it may be urged that the membranous Tasmanian specimens also produce fructification abundantly.

3. SPHÆROPHORON *compressum*, Ach., *Syn. Lich.* p. 287. Lichen fragilis, *Eng. Bot.* t. 114.

HAB. Lord Auckland's group and Campbell's Island; on the trunks of trees.

Under *S. australe*, Laur., we have stated our impression that this is a state of that plant.

4. STEREOCAULON, *Ach.*

1. STEREOCAULON *ramulosum*, Ach., *Syn. Lich.* p. 284. *A. Rich. Flor. Nov. Zel.* p. 34. t. 9. f. 3. S. macrocarpum, *A. Rich.* l. c. t. 9. f. 4. Lichen Salazinus, *Bory, Voy.* vol. iii. p. 106. t. 16. f. 3. (TAB. LXXX. Fig. 1.)

HAB. Lord Auckland's group and Campbell's Island; particularly abundant in the latter locality.

Our specimens of this plant are truly magnificent, and this has induced us to add a figure, shewing the globose appendices (abortive apothecia) which are not represented in the works quoted above. Small specimens of this species, both from New Zealand, Tasmania and the group now under consideration, so much resemble the *S. paschale*, as to be with difficulty discriminated from it, whence we suspect the present plant may prove a remarkably luxuriant state of that, for it is abundant throughout many warm latitudes, to the exclusion of the *S. paschale*, which reappears in the higher latitudes of Cape Horn and Kerguelen's Land.

PLATE LXXX. *Fig.* I.—1, vertical section of an apothecium; 2, portion of lamina proligera:—*both magnified.*

2. STEREOCAULON *Argus*, Hook. fil. et Tayl.; thallo erecto tereti-cylindraceo v. subcompresso fastigiatim ramoso albo-cinerascente, gemmis granulatis ramosis, ramulis appendicibus globosis plerumque terminatis, apotheciis terminalibus, excipulo thallode crasso extus rugoso, margine primum inflexo, disco brunneo concavo demum reflexo. (TAB. LXXIX. Fig. II.)

HAB. Campbell's Island; rocks on the mountains, abundant.

Thallus validus, 2–3 unc. altus, primum strictus, erectus, demum curvatus, elongatus. *Apothecia* magnitudine varia, semper margine thallode crasso immersa; excipuli marginibus ætate per reflexionem marginis apothecii omnino occlusis; ascis oblongo-lanceolatis, granulis angulatis repletis, filamentis raris dilatatis transverse septatis immixtis.

A very distinct plant, well characterized by the thick cup into which its plane apothecia are immersed, the latter in age become much broader, their margins roll back carrying the border of the excipulus inwards, when it requires a longitudinal section to shew the true nature of the apothecium.

PLATE LXXIX. *Fig.* II.—1, a specimen in the ordinary state; 2, the same much older, both of the *natural size*; 3, section of young apothecium; 4, section of ripe ditto; 5, the same when old; 6, portion of lamina proligera; 7, septate filament; 8, asci:—all more or less *magnified.*

5. CÆNOMYCE, *Ach.*

1. CÆNOMYCE *rangiferina*, Ach., *Syn. Lich.* p. 277. *Engl. Bot.* t. 173.

HAB. Lord Auckland's group and Campbell's Island; on the ground.

I

Stereocaulon ramulosum. Ach.

II

Cenomyce aggregata. Ach.

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2. Cænomyce *aggregata*, Ach., *Syn. Lich.* p. 275. C. terebrata, *Laurer, in Linnæa*, vol. ii. p. 43. (*fid. cel. Montagne.*) Dufourea collodes, *nobis, in Lond. Journ. Bot.* vol. iii. p. 650. (Tab. LXXX. Fig. II.)

Hab. Lord Auckland's group and Campbell's Island; on the ground, abundant.

One of the most widely diffused species throughout the Southern Hemisphere; though variable, its limits are well defined. Its nearest ally is the beautiful *C. retipora*, Lab.

Plate LXXX. *Fig.* II.—1, a specimen in the ordinary state, *natural size*; 2, portion of the same, *magnified*; 3, large, and 4, small variety, *natural size*; 5, apothecium, *magnified.*

3. Cænomyce *ecmocyna*, var. *gracilis*, Ach. *Syn. Lich.* p. 261. *Engl. Bot.* t. 1284. *Schærer, Lich. Helv.* vol. lxv. C. sarmentosa, *nobis, in Lond. Journ. Bot.* vol. iii. p. 651.

Hab. Lord Auckland's group; on dry ground on the hills.

4. Cænomyce *pyxidata*, Ach., *Syn. Lich.* p. 252. *Engl. Bot.* t. 1393. *Schærer*, no. 68.

Var. *rigida*; olivaceo-cinerea tota gemmis granulatis tecta, thallo foliaceo, podetiis brevibus inflatis rigidis scaberrimis. C. rigida, *nobis, in Lond. Journ. of Bot.* p. 652.

Hab. Lord Auckland's group; in the woods; β, on dry turfy soil.

5. Cænomyce *uncialis*, Ach., *Syn. Lich.* p. 276. *Engl. Bot.* t. 174.

Hab. Lord Auckland's group. (*Admiral D'Urville.*)

6. PELTIDEA, *Ach.*

1. Peltidea *polydactyla*, Ach., *Syn. Lich.* p. 240. *Mougeot et Nestler*, n. 633.

Hab. Campbell's Island; on the ground, abundant.

7. STICTA, *Ach.*

1. Sticta *orygmæa*, Ach., *Syn. Lich.* p. 233. *Montagne in Voy. au Pole Sud, Bot. Crypt.* t. 15. f. 1.

Hab. Lord Auckland's group and Campbell's Island; on the branches of shrubs, very abundant.

Acharius cites "Staten Land" as the habitat of this species; we have never seen specimens from the American Continent (the Cape Horn station quoted in the 'Lond. Journ. of Bot.' being erroneous), whence it is possible that the author may refer to another plant; we have, however, followed our friend Montagne, who gives this name to his beautiful plate of our plant.

2. Sticta *foveolata*, Delise, *Monogr. de Sticta*, p. 101. t. 8. f. 36. *Mont. in Voy. au Pole Sud, Bot. Crypt. ined.* S. linearis, *nobis* (*in part*), *Lond. Journ. of Bot.* vol. iii. p. 647.

Hab. Lord Auckland's group; on the trunks of trees.

Except in being of a rather larger size, this does not differ from a copious suite of specimens which we have examined from Tasmania. The apothecia are variable, generally with the disk flat, but sometimes concave, and in these specimens very much so. In both this and the *S. Billardieri*, which seems hardly distinct from it, the border of the apothecia is often evanescent.

3. Sticta *Freycinetii*, Delise; thallo flavo-cinnamomeo rariusve olivaceo nudo glabro lævi plano v. concavo rimis albidis, subtus nudo v. velutino atro v. luride brunneo, lobis linearibus concavis divaricatim ramosis, marginibus undulatis crenatis v. sinuato-lobatis glaberrimis v. sorediatis, cyphellis albidis, apotheciis sparsis plerisque marginalibus breviter stipitatis concavis extus villosis puberulisve, disco plano rufo-fusco demum valde concavo, margine fimbriato crenato ætate involuto.—S. Freycinetii, *Delise, Monogr. de Sticta*, p. 124. t. 14. f. 45. S. glabra, *nobis, in Lond. Journ. of Bot.* vol. iii. p. 647.

Hab. Lord Auckland's group and Campbell's Island; on the trunks of trees and on rocks in mountainous places, very abundant.

An exceedingly variable plant, of which we have added a character, that of Delise being imperfect. The most obvious specific distinction lies in the pubescent apothecia with fimbriated margins to the cups, to which may be added, the pale colour, and the wrinkled margins of the lobes, which are sometimes extremely concave. In alpine specimens the thallus is often quite smooth underneath, with the margins singularly crumpled. The colour varies, underneath it is of all shades, from black to a dirty yellow. Cape Horn and Falkland Island specimens are more plane, with the lobes and apothecia larger.

4. Sticta *cellulifera*, Hook. fil. et Tayl.; thallo stellatim expanso subdichotome ramoso fusco v. flavo olivaceo sæpe virescente glabro profunde reticulatim lacunoso rimis albidis, subtus fuliginoso tomentoso apicibus loborum flavescentibus, lobis latiusculis rotundatis angulatisve subacutis obtusis retusisve, cyphellis parvis flavis, apotheciis plurimis plerisque marginalibus, disco atro plano demum concavo, marginibus integris crenulatisve inflexis.

Hab. Lord Auckland's group and Campbell's Island; on the trunks and branches of trees, abundant, also on the mountain rocks.

We know of no single character by which this form, which is as variable as any of its congeners, may be recognized. In its normal state the whole frond is fully a span across, all parts of it rugose with deep lacunæ; specimens from the woods are of a lax habit, with lobes an inch broad, of a pale brown or yellow beneath; those from the mountains, again, are deep olive green and almost black beneath, with the lobes short and round, and the cyphellæ of a bright yellow. In many respects it is very closely allied to the *S. carpoloma*, Delise, which, according to Montagne (whose authentically named collection of *Stictæ* is the completest I have seen), has the apothecia invariably marginal. The present plant includes in part both *S. impressa* and *S. cellulifera*, of the 'London Journal of Botany.'

5. Sticta *Menziesii*, Hook. fil. et Tayl.; thallo stipitato valde coriaceo obovato-cuneato ecostato flavo-fusco subtus brunneo, laciniis planiusculis lobatis retusis supra glaberrimis lævibus subtus puberulis, cyphellis immersis luteis marginibus elevatis, apotheciis sparsis atro-fuscis, disco plano demum concavo, marginibus tenuiter inflexis.

Hab. Lord Auckland's group; on the trunks of old trees.

Discovered by Mr. Menzies in Dusky Bay, New Zealand. Very distinct from *S. filicina*, of Acharius, in the ecostate frond, very thick texture, and dark coloured apothecia. Mr. Menzies' specimens have rather broader lobes, but do not otherwise differ from those gathered in Lord Auckland's group. The *S. latifrons*, A. Rich., is also costate, and of a different colour, with small pale yellow-red apothecia. The present is in New Zealand probably confined to the southern extremity.

6. Sticta *Richardi*, Mont., *Voy. au Pole Sud, ined.* S. carpoloma, *A. Richard, Flor. Nov. Zel.* p. 30. t. 9. f. 1.

Hab. Lord Auckland's group; on the trunks of trees.

Dr. Montagne distinguishes this from the *S. carpoloma*, Delise, by its having the apothecia on the surface, as well as on the margins of the frond, and by its different under surface. Our specimens are in a rather imperfect state.

The *S. variabilis*, Ach., is also enumerated by Montagne as a native of Lord Auckland's group.

8. PARMELIA, *Ach.*

1. PARMELIA *rubiginosa*, Ach., *Syn. Lich.* p. 202. Lichen affinis, *Engl. Bot.* t. 983.

HAB. Lord Auckland's group and Campbell's Island; on the bark of living trees, also on the ground on the hills.

A most variable plant and a very abundant one in New Zealand and Tasmania; on the hills the thallus is reduced to a few imbricating scales, as in *Squamaria*, and the apothecia are strangely contorted and closed, having the border closely inflexed; in this state we are inclined to suspect that it passes into the *Lecanora Hypnorum* of these islands.

2. PARMELIA *sphinctrina*, Mont. *in Voy. au Pole Sud, Bot. Crypt.* t. 15. f. 3.

HAB. Lord Auckland's group; on the bark of trees.

This, judging from our copious suites of Tasmanian and New Holland specimens, is hardly distinct from *P. rubiginosa*. Montagne's figure of it is excellent.

9. LECANORA, *Ach.*

1. LECANORA *Hypnorum*, Ach., *Syn. Lich.* p. 193.

HAB. Campbell's Island; upon tufts of *Andreæa* and other mosses.

The upright mode of growth and slender laciniæ of the thallus, distinguish the present from its allies; the specimens are of a dusky yellow colour.

2. LECANORA *versicolor*, Hook. fil. et Tayl.; substrato adnato tenui atro, thalli squamulis subrotundis planis crenulatis albidis demum flavis confertis lævibus, apotheciis majusculis sessilibus concavis, disco nigro-pruinoso, margine integerrimo subincurvo.

HAB. Lord Auckland's group; on bark.

Cæspites 1 unc. latæ, nigro-limitatæ, substrato continuæ, fuscæ v. pallide virescentes. *Apothecia* squamis majora, disco nigro-pruinoso, margine thallode crassiusculo.

Allied to the *L. varia*, but marked by the scattered apothecia, dark discs and smooth thallodal border.

3. LECANORA *tartarea*, Ach., *Syn. Lich.* p. 172. *Engl. Bot.* t. 156 et 1634.

HAB. Lord Auckland's group; on the ground.

Specimens, apparently of this plant, are in a very imperfect state.

4. LECANORA *Parella*, Ach., *Syn. Lich.* p. 169. *Engl. Bot.* t. 727.

HAB. Lord Auckland's group; on the hills.

Also in a very rudimentary state.

10. LECIDEA, *Ach.*

1. Lecidea *geomœa*, Taylor, *in Flor. Hibern.* p. 124. L. uliginosa, var. γ, *Ach. Syn. Lich.* p. 25.

Hab. Lord Auckland's group; on the ground.

2. Lecidea *incana*, Hook., *Br. Fl.* vol. ii. p. 181. Lichen incanus, *Engl. Bot.* t. 1683. Biatora pachycarpa, *Fries, Lich. Europ.* p. 259.

Hab. Lord Auckland's group; on the ground.

Mr. Churchill Babington informs us, that he has proved the *L. incana* to be merely a deliquescent state of Fries's *Biatora pachycarpa*.

11. PORINA, *Ach.*

1. Porina *granulata*, Hook. fil. et Tayl.; thallo tartareo granulato albido, granulis subrotundis rugosis confertis fertilibus majoribus, poris 1–5 pertusis, nucleis pellucidis pallide lutescentibus.

Hab. Lord Auckland's group; bare ground on the hills.

This plant grows mixed with young states of *Lecanora Parella*, from which it is with difficulty distinguished, it forms large pure white or pinkish patches, sometimes several inches in breadth, very convex, and often raised above the soil; the apothecia are hemispherical, with a broad depression, in the centre of which again is often a conical mamilla; there appear to be no spores in the apothecia, and the plant may be merely a rudimentary form of some more highly organized lichen. It is also abundant at Cape Horn and in the Falkland Islands.

12. THELOTREMA, *Ach.*

1. Thelotrema *lepadinum*, Ach., *Syn. Lich.* p. 115. Lichen inclusus, *Engl. Bot.* t. 678.

Hab. Lord Auckland's group; on the bark of trees, abundant.

13. OPEGRAPHA, *Ach.*

1. Opegrapha *atra*, Pers.; O. denigrata, *Ach. Engl. Bot.* t. 1753.

Hab. Campbell's Island; on the bark of *Dracophyllum scoparium*.

ALPHABETICAL INDEX

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CONTAINING THE

BOTANY OF LORD AUCKLAND'S GROUP AND CAMPBELL'S ISLAND.

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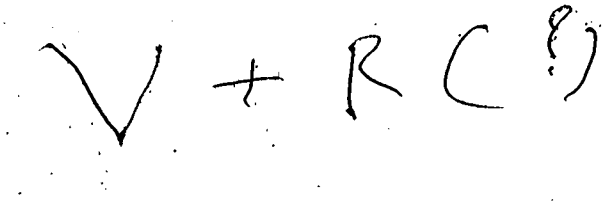

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